

The Mediation Effects of Teachers' Quality and Organizational Factor on the Relationship between Teachers' Leadership and Teachers' Professional Development: A Case Study of Art Teachers in Colleges and Universities in Shenyang City, Liaoning Province

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Abstracts

The objectives of this research were: (1) To study the effect of art teachers' leadership on art teachers' professional development; and (2) To find the mediating effects of teachers' quality on the relationship between art teachers' leadership and art teachers' professional development in Shenyang's public colleges and universities; and (3) To find the mediating effects of organizational factors on the relationship between art teachers' leadership and art teachers' professional development in Shenyang's public colleges and universities.

The research was a quantitative research method. Population was Art teachers of 10 public colleges and universities in Shenyang, Liaoning Province, totaling 1056 people. The samples were obtained through G * Power software, with a total of 122 people. The key informants were Art teachers in public colleges, obtained by purposive sampling method. The instruments used for data collection was Online questionnaire survey platform_ Questionnaire Star. The statistics used for data analysis were confirmatory factor analysis (CFA) and structural equation model (SEM) were used for the data.

The research findings revealed that; (1) the constituent factors of the professional development of art teachers in public colleges and universities in Shenyang City, Liaoning Province include: art teacher leadership; teacher quality; organizational factors; teacher professional development. and (2) Analyzed the impact on the professional development of art teachers in public colleges and universities in Shenyang City, Liaoning Province, and found that the leadership of art teachers has a direct impact on the professional development of art teachers through the intermediary variable teachers' personal quality and organizational factors.

Keywords: Teachers' Quality; Organizational Factor; Teachers' Leadership; Teachers' Professional Development

Introduction

In recent years, with China's accession to the WTO, the economic development has entered the fast lane, and the higher education policy has been increasingly improved, which has promoted the development of various colleges and universities, and escorted the economic development. As the cradle of cultivating talents directly, colleges and universities play an increasingly important role in the whole education system. As the capital city of Liaoning Province, Shenyang is the center of politics, economy, science and education, culture and

transportation. In Shenyang, which has nearly 50 colleges and universities, in the process of development, it is inseparable from these colleges and universities to cultivate excellent cultural talents for the city, of course, including fine arts and cultural talents. The core competitiveness of colleges and universities lies in the quality of talent training, and good talent training quality depends on teachers. Therefore, the establishment of high-quality teachers is also an inevitable requirement for the development of colleges and universities (Wu Y. , 2010).

Teachers, as preachers, are the main leaders in the teaching process and other related activities, which requires teachers to have professional knowledge, skills, professional quality, and have the characteristics of honesty, competence, foresight, and encouragement, and be able to use knowledge and practical ability to guide students to achieve goals and complete tasks. Teachers are always a valuable resource of a school. The transformation of the school and the development of students ultimately depend on teachers to promote implementation. The theory of teacher leadership and teacher professional development provides a basis for the study of the growth path of university teachers. The professional development of teachers determines the quality of teachers, and the quality of teachers determines the quality of teaching. Teachers' leadership is based on teachers' personal development and also rooted in teachers' professional development. Teacher professional development is a continuous process, which runs through the whole career of every teacher. Using the theory of teacher leadership to promote the professional development of teachers, explore the relationship between the two, and help teachers establish a correct "leadership concept", which has strong practical significance for the development of teachers and teachers' groups. The development of teacher leadership can promote the professional development of teachers themselves, so that every teacher can obtain happiness in their own career, and ultimately promote the continuous development of education.

Research definition and objectives

Research definition

Teacher Leadership, as a sub-concept of leadership, teacher leadership is the application of leadership in the field of education and the ability of teacher leaders to influence other members of the group to achieve organizational goals. The leadership of university teachers includes four dimensions: professional ethics leadership, teaching leadership, scientific research leadership, and social relations leadership.

Teacher professional development refers to the process of individual and internal professional improvement of teachers based on the professional characteristics of teachers, including the improvement of comprehensive quality including all knowledge, skills, abilities and emotional characteristics related to teaching activities.

Organizational factors including incentive system and school atmosphere. The school atmosphere includes teaching atmosphere and interpersonal atmosphere. The incentive system refers to the policy support, help and care provided by the school for the interests and development of teachers in the process of seeking development, such as the policy of salary, rewards and punishment, promotion conditions, as well as the talent incentive mechanism and other relevant rules and regulations that affect teachers' performance. The teaching atmosphere included in the school atmosphere refers to the way to get along with colleagues and the ability to communicate and cooperate with colleagues in teaching work; Interpersonal atmosphere refers to the way to get along with colleagues in addition to work in the organizational atmosphere.

Teacher quality including the educational background obtained by teachers themselves in the early stage; Professional title obtained; Accumulated work experience; And the learning ability embodied on this basis. Through the early accumulation of these aspects, we can devote ourselves to continuous learning, and form and improve the comprehensive embodiment of the quality of individuals and teams in the learning process, which can be transformed into the ability to promote the practice and innovation of quality education, and promote the development of school art education.

Research objectives

1. To study the effect of art teachers' leadership on art teachers' professional development.
2. To find the mediating effects of teachers' quality on the relationship between art teachers' leadership and art teachers' professional development in Shenyang's public colleges and universities.
3. To find the mediating effects of organizational factors on the relationship between art teachers' leadership and art teachers' professional development in Shenyang's public colleges and universities.

Research Method

1. research design

Step 1: ask questions. This study will start with the investigation of the situation related to the research topic, carry out data analysis and comprehensive comparison to obtain information, and then carry out research questions.

Step 2: Analyze the problem. Prioritize the information. The variables to be studied are how to specify the sample size, target population and sampling technology, how to determine the data collection tools, and finally how to analyze the data based on descriptive statistics and inferential statistics.

Step 3: solve the problem. The researchers will analyze the collected data, make descriptive statistics, inferential statistics, CFA modeling and structural equation modeling reports on the data, summarize the research problems according to the data analysis results, and finally determine the solutions or make suggestions.

2. Population and sample

The object of this study is art teachers of public colleges and universities in Shenyang, Liaoning Province. In 2022, Shenyang, Liaoning Province, has 45 ordinary colleges and universities. In this study, 10 public colleges and universities with art majors in these colleges and universities will be selected by multistage random sampling method. According to the total number of in-service teachers of 1056, the sample size is calculated by using G * Power software to set the following parameters: effect size $w=0.50$, α the error prob= 0.05 , the degree of freedom= 51 , and the statistical data of 0.80 are obtained through chi-square test. The total number of samples is 122 teachers. This study mainly adopts the following methods: literature research; Survey and research methods; Quantitative analysis; Comparative research methods and other methods.

3. Data processing and data analysis

Through the survey tool of this study - questionnaire, sample the sample population, collect and sort out the data, sort out the valid questionnaire, and correct and delete the invalid questionnaire. The total number of valid questionnaires collected in this study is 158, which is larger than the expected 122. For these 158 questionnaires, data processing and data analysis

are carried out. Descriptive statistical analysis, basic statistical value analysis, model testing, inferential statistics, and path analysis are used to find the intermediary role of teachers' quality and organizational factors in the relationship between teachers' leadership and teachers' professional development in Shenyang. Finally, the hypothesis of path coefficient and its direct and indirect effects are tested by test statistics.

Conceptual Framework

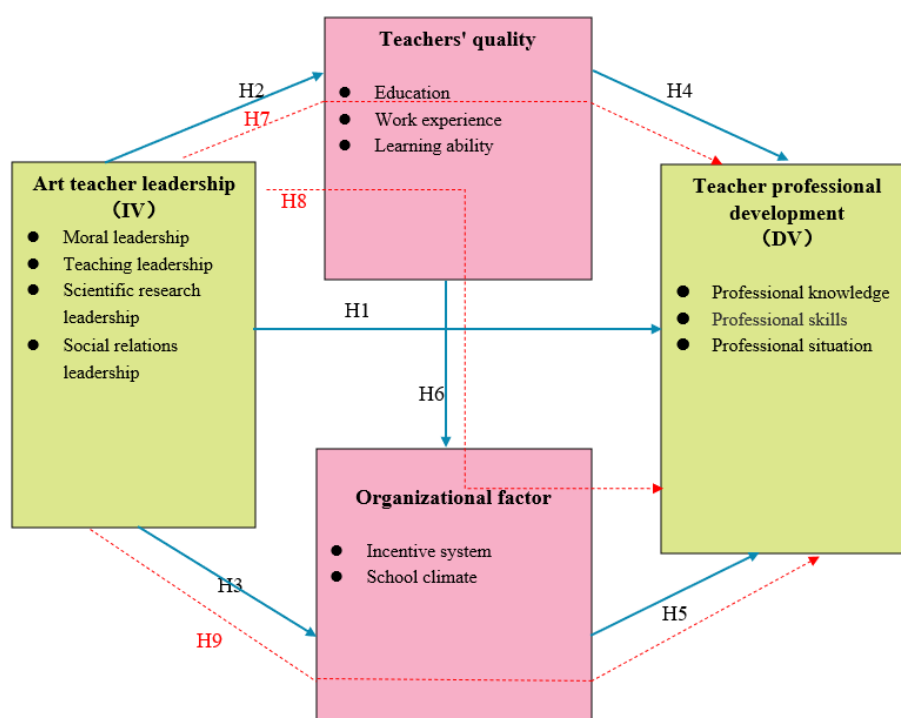


Figure 1 Parsimony CFA model (Standardized estimates)

2. Model evaluation the parsimony model

Table 1 Parsimony Model fit evaluation.

Measure	Estimate	Threshold	Interpretation
χ^2	854.8	--	--
df	509	--	--
χ^2/df	1.679	Between 1 and 3	Excellent
CFI	0.93	>0.95	Acceptable
SRMR	0.04	<0.08	Excellent
RMSEA	0.07	<0.06	Acceptable

Table 2.1 Shown model fit evaluation of original measurement model. The data analysis revealed that the chi-square was 854.8 with degrees of freedom of 509, the CMIN/DF or relative chi-square was 1.679 which conformed to the threshold of between 1-3, or excellent fit. The comparative fit index (CFI) was 0.93 which was conform to the threshold of >0.95 or terrible fit. The standard root mean square (SRMR) was 0.04 which conformed to the Threshold of <0.08 or shown excellent fit. The Root Mean Square Error of Approximation (RMSEA) was 0.07 compare to the threshold of <.06 was still acceptable.

From data analysis above, we concluded that the original measurement model can fit well.

3. Quality of measurement model

Table 2 the composite reliability (CR), the average variance extracted (AVE) the maximum shared variance (MSV), the Maximum reliability (MaxR(H)), and the latent variables intercorrelation with square root of AVE at the diagonal.

Latents	CR	AVE	MSV	MaxR(H)	TL	TQ	OF	TPD
TL	0.98	0.923	0.948	0.982	0.961			
TQ	0.981	0.946	0.962	1.279	0.974***	0.973		
OF	0.906	0.828	0.962	0.906	0.961***	0.981***	0.91	
TPD	0.977	0.934	0.933	0.978	0.902***	0.899***	0.966***	0.966

Note: in order to identifying the latent variable reliability, the $CR \geq .70$, MSV less than CR and the $MaxR(H) > CR$, in order to identifying the convergent validity, the $AVE \geq .50$, to identify the discriminant validity by the method of Fornell & Larcker, the square root of the latent variables must be greater than its correlations to the others latent variables.

Reliability

In this model we used the composite reliability to assess the measurement model reliability with the cut off criteria of .70 (Hair, et. al, 2019). Date analysis in table 4.2 showed that the CR value of TL is 0.98, the CR value of TQ is 0.981, the CR value of OF is 0.906, and the CR value of TPD is 0.977, which indicates that the selection and preparation process of questionnaire items is relatively successful, and the internal consistency is better. It can be seen that the data of this scale is authentic and reliable.

Convergent validity

In From Table 4.2, the AVE value of TL is 0.923, TQ value is 0.946, OF value is 0.828, and TPD value is 0.934. It can be seen that all AVE values are greater than 0.5, which means that the data of this scale is very high, which provides a guarantee for the next research.

Discriminant validity

From Table 4.2, the MSV value is mainly observed. The MSV value of TL is 0.948>AVE value is 0.923, the MSV value of TQ is 0.962>AVE value is 0.946, the MSV value of OF is 0.962>AVE value is 0.828, and the MSV value of TPD is 0.933 and AVE value is 0.934. From the MSV values of the above four dimensions, we can see that the discriminant validity of the scale data is very good. However, it is worth noting that the OF value in this group of data is 0.91, which is less than the previous value of 0.981, but does not affect the discriminant validity.

4.Hypothesis testing

Table 3 Hypotheses test for direct effects

Direct effects	Estimate	Beta	S.E.	z	p	Hypotheses
TPD <--- TL	0.3	0.29	0.43	0.7	0.48	H1
TQ <--- TL	1.01	0.97	0.11	9.52	***	H2
OF <--- TL	0.19	0.17	0.45	0.43	0.67	H3
TPD <--- TQ	-0.21	-0.21	0.58	-0.37	0.71	H4
TPD <--- OF	0.81	0.85	0.41	1.96	0.05	H5
OF <--- TQ	0.85	0.8	0.44	1.94	0.05	H6
Indirect effects						
TPD<--TQ<--TL	-1.56	-1.47	2.53	-0.58	0.56	H7
TPD<--OF<--TQ<--TL	1.96	1.85	2.57	0.72	0.471	H8
TPD<--OF<--TL	0.26	0.25	0.88	0.28	0.78	H9

Note: * represents $P \leq 0.05$, ** represents $P \leq 0.01$, *** represents $P \leq 0.001$

According to the data analysis in Table 3, hypothesis 1 is that teacher leadership (TL) has a positive impact on teacher professional development (TPD). In hypothesis testing, we usually observe the P value calculated according to the model, which is the result probability when the original hypothesis is true. The P value ≤ 0.05 statistically indicates that this hypothesis is valid. This table shows the P value, (p.0.48), which is greater than 0.05 and has no statistical significance, indicating that hypothesis 1 is unacceptable. Hypothesis 2: teacher leadership (TL) has a positive impact on teacher quality (TQ). This table shows the P value, (p.), which is less than 0.05, indicating that hypothesis 2 is valid. Hypothesis 3 shows that teacher leadership (TL) has a positive impact on organizational factors (OF). This table shows P value, (p.0.67), which is greater than 0.05, which is not statistically significant, indicating that hypothesis 3 is unacceptable. Hypothesis 4 shows that teacher quality (TQ) has a positive impact on teacher professional development (TPD). This table shows the P value, (p.0.71), which is greater than 0.05, which has no statistical significance, indicating that hypothesis 4

is unacceptable. Hypothesis 5 shows that organizational factors (OF) have a positive impact on teacher professional development (TPD). This table shows the P value, (p. 0.05), which is 0.05, indicating that hypothesis 5 is valid. Hypothesis 6 shows that teacher quality (TQ) has a positive impact on organizational factor (OF). This table shows the P value, (p. 0.05), which is 0.05, indicating that hypothesis 6 is valid.

In the indirect impact hypothesis test, hypothesis 7 shows that teacher leadership (TL) has a positive impact on teacher professional development (TPD) through teacher quality (TQ). In the hypothesis test, we usually observe the P value calculated according to the model. The P value is the result probability when the original hypothesis is true. The P value ≤ 0.05 statistically indicates that this hypothesis is valid. This table shows the P value, (p.0.56), which is greater than 0.05 and has no statistical significance, indicating that this indirect assumption 7 is unacceptable. Hypothesis 8 shows that teacher leadership (TL) has a positive impact on teacher professional development (TPD) through teacher quality (TQ) and organizational factor (OF). This table shows P value, (p.0.471), which is greater than 0.05, which is not statistically significant, indicating that this indirect hypothesis 8 is unacceptable. Hypothesis 9 shows that teacher leadership (TL) has a positive impact on teacher professional development (TPD) through organizational factors (OF). This table shows P value, (p.0.78), which is greater than 0.05, which is not statistically significant, indicating that this indirect hypothesis 9 is unacceptable.

Conclusion and Discussion

1. Conclusion

Hypothesis 1 the leadership of art teachers has no direct impact on the professional development of art teachers. Hypothesis 3 The leadership of art teachers has no direct impact on the organizational atmosphere of the school. Hypothesis 4 The factors of art teachers themselves have no direct impact on the professional development of art teachers. Hypothesis 7 The leadership of art teachers has no indirect impact on the professional development of art teachers through their own quality. Hypothesis 9 The leadership of art teachers has no indirect impact on the professional development of art teachers through organizational factors. In previous studies of experts and scholars on teacher leadership and teacher professional development, the research results have a significant impact, and the theory in this regard is very strong (Wang Y. , 2019) (Chen D. , 2017). A good school atmosphere and the improvement of teachers' quality have a positive role in promoting teachers' professional development (Li , 2008) (Zhao, 2018). The research results of this study are different from the previous research results of other experts. It may be that there is no or very little special research on the group of art teachers. The art discipline has its specialty particularity. As an art discipline, there are professional differences between arts, science and engineering, and medicine. It may be that there are professional differences in the population sample of this study, or the time of data collection, It is caused by a series of objective reasons, but this study provides relevant research basis and data reference basis for follow-up research.

Hypothesis 2 The leadership of art teachers has a positive and direct impact on the improvement of their own factors. Hypothesis 5 The school organizational atmosphere has a positive and direct impact on the professional development of art teachers. Hypothesis 6 Art teachers' own factors have a positive and direct impact on the school organizational atmosphere. Hypothesis 8 The leadership of art teachers has an indirect impact on the professional development of art teachers through the improvement of their own quality and

good organizational atmosphere (Stefan & Olivera , 2016) (Susanne & Andreas , 2018) In the previous expert research results, teacher leadership has a significant impact on teacher quality. Different organizations in the school perform their respective duties and responsibilities in teacher professional development, which is indispensable. The teacher professional development developed under the positive organizational atmosphere of the school is a healthy development (Lin, 2014). No matter what time and place, teachers' professional development needs to be nurtured and nurtured by schools, education-related departments and other powerful matrixes (Xu , 2012). With the improvement of teachers' quality and good organizational atmosphere, teacher leadership plays a role in promoting teachers' professional development (Gao , 2021). This study is the same as the previous research conclusions of experts and scholars. It enriches the methods and ways for art teachers to improve their own quality, strengthens the weak links of the research, and expands the relevant research in the fields of organizational climate, teacher performance, innovation, etc. The relevant conclusions provide a theoretical basis for the follow-up research, and also provide practical inspiration and guidance for school managers.

2. Discussion

2.1 Change the traditional school leadership concept and realize distributed leadership

Improving the leadership ability of art teachers requires the "decentralization" of school leaders - the democratization of school decision-making process. In order to give full play to the leadership role of art teachers, researchers believe that the implementation of distributed leadership strategy provides a new perspective for the study of teacher leadership. Through this theory, teachers no longer have fixed leadership positions. The internal organization of the school only allows the allocation of management functions to individual teachers, and complex teaching tasks can be carried out more comprehensively. Teachers also need to take the responsibility of developing themselves and others, managing themselves and others. Teachers have the right and obligation to become leaders, and take the responsibility of sustainable development of the school organically (Gao Y. , 2014).

2.2 Improve the individual quality of teachers

To strengthen the accumulation of teachers' knowledge, teachers must have rich and in-depth professional knowledge reserves, and other relevant disciplines, such as management, psychology, sociology, and other disciplines. They also have a strong interest in the knowledge of other disciplines between classes, and will continue to learn and absorb to adapt to the current education. Second, strengthen the construction of teachers' teaching ability. In order to effectively prevent teachers from "having knowledge in mind, but not speaking", we must strengthen the construction of teaching skills. Such as modern teaching methods, advanced teaching concepts, education-related psychological skills, student management essentials, etc. Third, "sponge" learning ability. In the new era of "Internet plus", learning advanced teaching tools, teaching tools and new teaching methods are combined, such as professional multimedia resources, a large number of micro courses, online live broadcast platform, student information management platform, flipped teaching equipment, etc.

2.3 Rebuild the school cultural atmosphere

A good campus atmosphere plays an important role in promoting teachers' leadership and professional development. As an art teacher, his confidence in the development of his professional ability is not only from his own professional pursuit, but also from the radiation of his school environment to a certain extent. School leaders should abandon the previous

idea of "one size fits all" and "monopolizing power", build a school learning community, and create a good atmosphere for teachers to learn and progress together, so as to promote teachers' scientific research ability and teaching experience (Gong , 2020).

Implement effective supervision, evaluation, reward and guarantee system. Art teachers in colleges and universities should have the ability to update their knowledge and ensure the teaching quality and level through the reward and assessment system. In the process of supervision, assessment and reward, teachers should be evaluated objectively and impartially from different levels through multi-angle and multi-dimensional methods. At the same time, it is also of great significance to appropriately reduce the burden on teachers, ensure teachers have a stable and high-quality working environment, and encourage teachers to develop a higher sense of work happiness and school belonging.

2.4 Professional development measures for art teachers

2.4.1 Build a high-level mechanism for art teacher training and further study, and carry out school-based teaching and research model

The first is the necessary induction training. Such training is mainly school training, and the training content belongs to the field of pedagogy, such as educational practice theory, educational psychology and educational administrative regulations. Secondly, do a good job of regular school-based teaching and research. Set up a learning group to carry out collaborative group behavior research and gather the wisdom and strength of the whole group. The third is to encourage art teachers in colleges and universities to take advanced courses in high-level and professional colleges and universities. High-quality universities have rich academic resources. Continuing education teachers can improve their own experience, acquire teaching knowledge and skills, improve the professional ability of college art teachers, and promote professional development and teaching reform.

2.4.2 Establish the concept of self-renewal and strengthen the self-development awareness of college art teachers

According to relevant research conclusions at home and abroad, there are two main ways for art teachers to strengthen their professional development. One is outward seeking, that is, to promote their professional development through seeking external forces and help, such as training; The second is introverted seeking, which means that art teachers have the consciousness of self-development and can achieve their professional growth through self-development. This study shows that teachers' professional formation process is based on individual self-reflection in advance, and the most important method of self-development is reflective teaching. At the same time, cultivate the habit of reading. Reading is the basis of reflection and can actively read books. An excellent art teacher, in addition to his classroom teaching ability, depends largely on his own love for education and his friendship for education.

In short, the leadership of art teachers and the professional development of art teachers have internal consistency in value orientation, development path, functional objectives and other aspects. At the same time, improving teachers' leadership plays an important role in promoting teachers' professional development, enriching teachers' professional role cognition, enhancing teachers' professional development self-esteem, and promoting teachers' professional development. Facing the challenges and opportunities faced by teachers' professional development under the new situation, art teachers should dare to become leaders, be willing to become leaders, and be willing to become leaders, fully explore their own internal leadership ability, and provide valuable guidance strategies for schools and teachers'

professional development. In this study, under the mediation of teachers' quality and organizational factors, the art teacher's leadership conforms to the predicted value and the actual value of the art teacher's professional development assessment ($R^2 = 0.85$), the better the regression fitting effect is, so the correlation of this study is very high. The remaining 15% will be further studied by future art educators.

Recommendations

1. Recommendation for Policies Formulation

With regard to the teacher education policy, there are the Opinions of the State Council on Strengthening the Construction of Teachers, the 13th Five-Year Plan for the Development of National Education, the National Plan for the Development of School Art Education (2011-2020) and other relevant documents, but they have not really penetrated into the field of teacher leadership. In fact, relevant departments do not pay enough attention to teacher leadership training, and the specific concept of teacher leadership training is not clear. The design of top promotion needs to be strengthened, and the relevant education authorities also need to strengthen their efforts. National policies strengthen research, teacher leadership and the top-level design of progress. Relevant educational institutions should speed up the pace, create a platform for teachers and cultivate leadership at all levels with the help of relevant policies to promote teacher leadership. At the same time, we should democratize the school decision-making process in all colleges and universities, implement distributed leadership, transform and share to improve the participation of teachers. Management support is crucial to the successful leadership of art teachers. Only when the policy keeps up, can art teachers in colleges and universities really gain methods and knowledge that are conducive to the development of their own teachers' leadership and improve their own leadership.

2. Improving the leadership ability of art teachers requires the "decentralization" of school leaders - the democratization of school decision-making process. Transform and share to improve teacher participation. Management support is crucial to the successful leadership of art teachers.

3. Recommendation for Further Research

Due to the limited time and insufficient knowledge of the researchers, the sample size and geographical scope of this study are small. The future research on the leadership of art teachers can expand the research scope to achieve more comprehensive professional development and objective research data and conclusions.

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