

Methodological Study on Measuring Teacher Leadership

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Abstract

The purpose of this study is to develop an assessment instrument for measuring the leadership skills of kindergarten teachers and to verify its validity and reliability using mathematical-statistical methods. Kindergarten teacher leadership skills consist of two main components: Core Competencies (Fundamental Skills): Abilities related to core leadership activities, such as planning, organizing, motivating, activating, and controlling. Personal Competencies (Individual Skills): Abilities based on personal traits, including decision-making, principled behavior, influence, advocacy, integration/unifying, and social communication skills. The development of the leadership assessment instrument was based on two dimensions: teacher leader characteristics and essential leadership competencies. For the purpose of evaluating these dimensions within the scope of this research, an assessment instrument was developed with 22 items: 13 questions related to leader characteristics and 9 questions related to essential competencies. The validity and reliability of this instrument will be assessed using Factor Analysis (Exploratory Factor Analysis and Confirmatory Factor Analysis). This study is expected to contribute to the development of a reliable instrument for assessing kindergarten teacher leadership.

Keywords: *kindergarten teacher, leadership skills, instrument for assessing, validity, reliability, factor analysis.*

Introduction

Leadership is the foundation of organizational success, sustainable development, and innovation. In educational institutions, teachers' leadership skills directly influence the quality of teaching and the outcomes of child development. Specifically, in pre-primary/preschool education institutions, teachers are the main driving force, and their leadership capacity is crucial for enhancing the educational environment for children, the instructional process, and the overall effectiveness of the kindergarten organization.

Scientifically defining and assessing the leadership skills of kindergarten teachers is an essential pathway to support their continuous professional development and to inform policies aimed at improving teacher competence. By developing leadership, it is possible to contribute not only to individual growth but also to increase the value of pre-primary education teachers at the societal level, thereby preparing skilled citizens for the future.

Therefore, the issue of assessing and developing kindergarten teachers' leadership skills has become a strategically important matter, impacting not only the education sector but also the future development of the country. The objective of this study is to define the leadership skills of kindergarten teachers, develop a methodology for measuring them, and investigate the reliability and validity of this methodology.

Literature review/Background

Leadership is often categorized as either innate or developed. Researchers generally believe that a person's leadership ability can be developed through practice, experience, and education, in addition to any naturally endowed traits. Leadership is the process of guiding and influencing others to achieve a specific goal. A leader engages in activities that influence the followers' motivation, needs, aspirations, confidence, satisfaction, and expected outcomes (Tsedevsuren, N., 2006).

Within the framework of leadership theory, two fundamental forms have been identified based on the nature of the relationship and cooperation between leaders and followers: self-serving

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(transactional) leadership and other-serving (transformational) leadership (James MacGregor Burns, 1978). Self-serving leadership is based on exchange—that is, it operates on the principle of "I for you, you for me" (Gunnar Andersson, Leif Fysen, 2005). This type of leader acknowledges the followers' needs to a certain extent but tends to substitute those needs with other self-interested goals.

The main objective of a self-serving leader is to gain power and consolidate one's own position, which one may pursue by disregarding ethical norms. In environments dominated by this type of leadership, the leader-follower relationship is often temporary, and they do not wish for the process of reciprocal exchange to continue indefinitely. Their focus is solely on meeting the needs of the current situation.

Applying this leadership paradigm to pre-primary/preschool education institutions is crucial for determining the quality of teacher leadership. Kindergarten teacher leadership is not only related to guidance skills but is also measured by the teacher-parent relationship and the impact on child development. Therefore, this study aims to define the specific characteristics of kindergarten teacher leadership and subsequently establish the methodological basis for developing that leadership.

Methodology

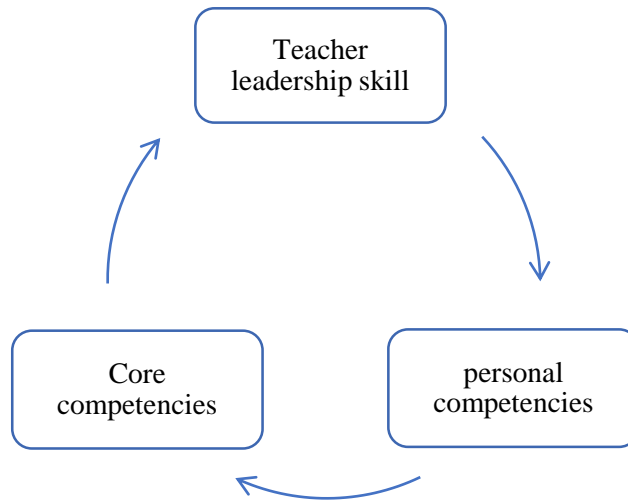
Kindergarten teacher leadership skills comprise two main parts: Core Competencies and Personal Competencies.

Core Competencies (Fundamental Skills): Abilities directly related to the teacher's professional activities and necessary for carrying out the main functions of leadership. These include the following:

- Planning Skill: Defining aims and objectives, developing plans in line with the context, optimizing work sequence, time management, and increasing productivity.
- Organizing Skill: Optimally distributing team structure and responsibilities, eliminating overlaps, and fostering cooperation.
- Motivating and Activating Skill: Boosting team morale, encouraging creative initiative, and appropriately managing formal and informal communication.
- Controlling Skill: Monitoring work progress, concluding/summarizing, reporting, evaluating performance, and identifying opportunities for improvement.

Personal Competencies (Individual Skills): Leadership abilities based on individual traits, focused on communication and decision-making skills. These include the following:

- Decision-Making Skill: Identifying the causes and consequences of problems, making decisions independently and collaboratively.
- Principled Behavior: Recognizing the essence of a problem, being flexible in context, and making appropriate decisions.
- Influence Skill: Solidifying the leader's position within the organization's internal and external environment, and instilling confidence in others.
- Advocacy Skill: Protecting the interests of the team and the results of their work, and managing internal organizational conflicts.
- Integration/Unifying Skill: Uniting people with diverse knowledge and skills, promoting cooperation, and managing communication conflicts.
- Socialization Skill (Social Competence): Implementing a balanced combination of individual, team, organizational, and social relationships. (Figure 1)

Figure 1. Kindergarten Teacher Leadership Skills

Ralph Stogdill's research suggests that leadership depends on many factors besides an individual's innate characteristics, including the situation, and the followers' skills, values, desires, and expectations. In alignment with this, the measurement of kindergarten teacher leadership in this study was classified into two directions: leader characteristics and essential leadership competencies.

In developing the leadership assessment instrument, a 5-point Likert scale (1 – Very Poor, 2 – Poor, 3 – Average, 4 – Good, 5 – Very Good) was used to construct the following 22 items. The assessment questionnaire will be validated using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). (Table 1)

Table 1. Instrument for Measuring Kindergarten Teacher Leadership Skills

Code	Item
T1	How is your ability to adapt to the situation?
T2	What is your character trait regarding social sensitivity?
T3	How is your result-oriented character trait?
T4	What is your self-confident and diligent character trait?
T5	How is your ability to cooperate/collaborate?
T6	How would you evaluate your resolute/decisive character trait?
T7	What is your trustworthy character trait?
T8	How would you evaluate your ability to influence others?
T9	What is your energetic and active character trait?
T10	What is your persevering and resilient character trait?
T11	How would you evaluate your self-confident character trait?
T12	How is your ability to cope with stress?
T13	How would you evaluate your responsible character trait?
T14	How would you evaluate your intellectual/wise skill?
T15	How would you evaluate your skill in developing your thoughts and skills?
T16	How would you evaluate your creative skill?
T17	How is your courteous/polished communication skill?
T18	How is your public speaking skill?
T19	How would you evaluate your teamwork skill?
T20	What is your organizational skill?
T21	How would you evaluate your skill in convincing and persuading others?
T22	How is your communication sensitivity/ethical/ skill?

Items T1-T13 are intended to assess the leader's character/traits, while items T14-T22 are intended to assess the leader's essential competencies/skills. The research results will be processed using factor analysis to determine the validity and reliability of the instrument.

This methodology is considered a crucial foundation for objectively determining the level of kindergarten teacher leadership and subsequently for developing policies aimed at enhancing teacher leadership capabilities.

Discussion

Within the scope of this study, a 22-item assessment questionnaire was developed to define the leadership skills of kindergarten teachers, and its validity and reliability were evaluated using factor analysis methods. Factor Analysis (Exploratory Factor Analysis - EFA) and Confirmatory Factor Analysis (CFA) were performed based on data collected from participating teachers to assess the suitability of the research instrument.

Factor Analysis

Factor analysis was performed in two stages. In the first stage, Exploratory Factor Analysis (EFA) was conducted to group the 22 variables into a smaller number of inter-related factors. The second stage, whether the data suitability was evaluated using the Kaiser-Meyer-Olkin (KMO) test, and the relationship between variables was assessed using Bartlett's Test of Sphericity. To confirm if the structure of the factors, Confirmatory Factor Analysis (CFA) was performed to measure the model fit.

Exploratory Factor Analysis

The Principal Component Analysis (PCA) method was used for EFA, and the data was checked with the KMO and Bartlett's tests.

- The KMO test value was =0.941 ($p<.000$), indicating that the data is highly suitable for factor analysis.
- Bartlett's Test of Sphericity was = $\chi^2=7024.845$ ($p<.000$), showing that the variables have a statistically significant correlation with each other.
- The total explained variance of the factor was = 90.891%, meaning the factors explaining teacher leadership skills fully cover 90.891% of the data.

Using the Varimax Orthogonal Rotation method for factor rotation, the 22 variables were consolidated into a single factor. The factor loadings ranged between 0.895 and 0.971, indicating a positive relationship between the variables and the factor.

Confirmatory Factor Analysis

To validate the results of the Exploratory Factor Analysis, Confirmatory Factor Analysis (CFA) was conducted using Structural Equation Modeling (SEM). The model fit indices for the CFA were evaluated according to the following metrics:

Model Fit Index	Appropriate Level	Initial Model Value	Improved Model Value
CMIN/DF	< 5.0	11.247	4.731
TLI	> 0.90	0.679	0.905
IFI	> 0.90	0.710	0.914
CFI	> 0.90	0.709	0.913
RMSEA	< 0.08	0.307	0.008

The initial model yielded values for CMIN/DF (=11.247) and RMSEA (=0.307) that were beyond the acceptable range. However, after making modifications using Modification Indices (MI) to improve the model, the fit indices met the standard requirements. The improved values (CMIN/DF = 4.731, IFI = 0.914, CFI = 0.913, RMSEA = 0.008) indicate that the research model is a good fit for the data.

Internal Reliability of the Model

The Cronbach's Alpha (α) coefficient was calculated to assess the internal consistency of the research instrument.

Reliability Statistics	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
Teacher Leadership Assessment	0.995	0.951	22

A Cronbach's Alpha of =0.995 indicates very high reliability of the instrument. The assessment model used in the study can be considered highly internally consistent and sufficient for producing accurate results (Hair et al., 2016).

Interpretation of Results

The study results confirmed that the instrument for measuring kindergarten teacher leadership skills is valid and reliable. The factor analysis showed that the 22 indicators measuring kindergarten teacher leadership skills converge into a single factor, and there is a strong positive correlation between the factors.

Furthermore, the high level of model fit between the developed instrument and the data, confirmed by the Confirmatory Factor Analysis, demonstrates that this assessment system can be used to determine the level of kindergarten teacher leadership.

Key Conclusions:

- The results of the Exploratory Factor Analysis confirmed the suitability of consolidating the 22 variables into a single factor.
- The Confirmatory Factor Analysis showed that the research instrument is a good fit for the data.
- The model fit indices confirm the reliability of the research model.
- The high Cronbach's Alpha coefficient proves the high reliability of the research questionnaire.

These results indicate that the assessment instrument is of significant importance for measuring, evaluating, and developing future policies related to kindergarten teacher leadership skills.

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