Research on the Construction of Indicator System for the Quality of Kindergarten Teacher's Work Environment

Ziying Zhang

Nanning College of Technology, Nanning, China

Zhangziying1997@gmail.com

Abstract: The quality of the working environment for kindergarten teachers not only has a crucial impact on their work engagement and job happiness, but also has a crucial impact on the quality of kindergarten education. At present, there is a lack of evaluation tools for the quality of the working environment of kindergarten teachers in China, which to some extent limits the current investigation and research on the quality of the working environment of kindergarten teachers. Therefore, this article adopts text analysis, questionnaire survey, and interview methods to form a project library based on existing relevant teacher work environment questionnaires, domestic and foreign policy documents, and teacher interviews. Combining organizational climate theory, data is collected through three rounds of questionnaire surveys, and exploratory factor analysis and confirmatory factor analysis are used to construct a quality indicator system for kindergarten teacher work environment. The indicator system structure model constructed by the research institute has a good fitting degree, good reliability and validity, and can be used to measure the quality of the working environment of kindergarten teachers. It has a positive significance for caring for the working environment of kindergarten teachers and dynamically adjusting preschool education resources at the practical level.

Keywords: Kindergarten teachers; Work environment quality; Indicator system

1. Introduction

In recent years, with the rapid development of preschool education, countries around the world have attached great importance to the high-quality improvement of preschool education in various aspects, processes, and perspectives. Although as early as 2011, the "Strong Beginnings III" report issued by the World Economic Cooperation Organization (OECD) identified improving the working environment of kindergarten teachers as an important way to improve the quality of preschool education. In 2014, the International Labour Office (ILO) also stipulated in the Policy Guidelines on Promoting Decent Work for Early Childhood Education Personnel that educators have the right to expect a work environment that is "safe, healthy, and promotes professional growth". However, most studies focus on the growth environment of young children, such as the quality of the learning environment and living environment. There are many tools for evaluating them, such as the Class scale, the ECERS scale, and the NQS certification assessment in Australia. There is still a large gap in research on the quality of the working environment for kindergarten teachers. In recent years, there has been a shift from "nurturing young children" to focusing on "nurturing young children with excellence", which has also increased the demand and attention of society for kindergarten teachers. The "high demands" from all sectors of society for kindergarten teachers are in contrast to their current situation of "low treatment" and "weak foundation". In practice, the working environment in kindergartens is in a poor state, mainly manifested by low salaries and benefits, lack of professional promotion channels, and excessive workload.

At present, the neglect of the quality of the working environment for kindergarten teachers will not only affect the job satisfaction, professional happiness, psychological health, etc. of the kindergarten teacher team in practice, but also cause low teaching efficiency, accelerate the loss of existing kindergarten teacher teams, and affect the choice of excellent talents to flow into the preschool education industry. Therefore, it is of great significance to attach importance to the working environment of kindergarten teachers and construct rich tools for their research.

2. Theoretical framework and research path for constructing an indicator system

The establishment of the quality indicator system for the working environment of kindergarten teachers is based on the guidance of the "top-down" organizational atmosphere theory structure and the "bottom-up" analysis based on policy documents, interview materials, and related questionnaires. Secondly, exploratory analysis and confirmatory analysis are conducted using SPSS 22.0 and AMOS 22.0 software to test the matching and appropriateness between various items and category dimensions. Three rounds of questionnaires are distributed, Two rounds of data testing project adjustments resulted in the establishment of a quality indicator system for the working environment of kindergarten teachers.

2.1 Theoretical Foundation of the Quality Indicator System for Kindergarten Teachers' Work Environment

The concept of organizational atmosphere is different from psychological atmosphere or job satisfaction. Psychological atmosphere (job satisfaction) refers to the evaluation of the conditions that an individual has in their work, and the degree to which these conditions are sufficient to meet their individual needs and expectations. The organizational atmosphere describes the objective conditions in the work environment based on the collective perception of workers.

As early as 1988, Paula Jordan Bloom, an American scholar, built the Evaluation Scale of Kindergarten Teachers' Work Environment by applying the framework of organizational atmosphere, and conducted research on 629 Preschool teacher representing 65 non-profit and for-profit centers in the United States through the construction of the scale. Therefore, both from the perspective of the internal structure of the theory and the previous research foundation, the applicability of its theoretical perspective in constructing an indicator system is demonstrated.

2.2 Maintaining the Integrity of the Specifications

2.2.1Literature analysis method

This study mainly selected three types of research literature for sorting. One is the document on the construction of kindergarten teacher teams issued by 20 ministerial and above levels in the past decade, as well as the relevant text extraction of national documents related to the "teacher work environment" clearly implemented by the Ministry of Education. The second is related theme documents with significant international influence, including the International Labour Organization's "Joint ILO UNESCO Committee of Experts on the Application of the Recommendations Conceptual Teaching Personnel (CEART) - The promotion of deep work for early childhood education personnel: The professionalization of a connected profession" document Relevant text extraction of Council Recommendation on 22 May 2019 on High Quality Early Childhood education and care system of the European Union and Guidelines on Measuring the Quality of the Working Environment of the Asia-Pacific Economic Cooperation OECD; The third is to sort out existing survey questionnaires and scales, including in 1988, American scholar Paula Jorde Bloom established the "Kindergarten Teacher Work Environment Evaluation Scale" based on the organizational framework. In 2015, Yau ho P Tamra Cumming et al., who developed the "Work Environment Rating Scale for Kindergarten Teachers" by Wong, and the "Early childhood educators' well being, work environments and 'quality'" developed in 2021, sorted out the indicators among them.

2.2.2Interview method

Before constructing the quality indicator system for the working environment of kindergarten teachers, this study took into account the nature of urban and rural areas, educational background, teaching age, teacher gender, and public and private kindergartens. A total of 6 kindergarten teachers were selected for semi-structured interviews to understand the relevant elements, current

situation, and personal impact of kindergarten teachers on the working environment. Six text materials were collected.

2.2.3Questionnaire method.

This research has compiled the Questionnaire on the Quality of Kindergarten Teachers' Working Environment, which is based on text analysis and questionnaire survey. It follows the steps of Dimantoulos and Winlhoker (2001) in developing formative questionnaires, and carries out a series of rigorous procedures such as defining the connotation, determining the questionnaire indicators, and testing the internal and External validity to develop the questionnaire on the quality of kindergarten teachers' working environment in China. In addition, this study also added a significant test of charge value beyond the above process, and non significant indicators should be deleted. This study mainly went through three stages.

Phase 1: Text collection. By reviewing relevant questionnaires and policy literature, combined with semi-structured interviews with front-line kindergarten teachers, a comprehensive textual information on the quality of kindergarten teachers' work environment is constructed.

Phase 2: Build an indicator library. By further analyzing the text material and combining it with the theoretical framework model, the initial indicator library is encoded and extracted.

Phase 3: Integration and revision. Preliminary integration of the indicator library to form the initial version of the questionnaire for pre research and exploratory and research analysis of SPSS 22.0 and AMOS 22.0 based on the research results, and further adjustment based on the data.

The questionnaire was distributed to kindergarten teachers in Baoding City and its subordinate areas in Hebei Province, China. After three rounds of questionnaire distribution, data testing, and project adjustment, the final quality indicator system for the working environment of kindergarten teachers has been determined.

3. Construction of the Quality Indicator System for the Working Environment of Kindergarten Teachers

In the process of determining the indicator system, reference was made to scholars such as Jiang Yong (2020) on the construction process of inclusive kindergarten indicator system, which is a "bottom-up" method to construct a questionnaire. Based on a deep understanding of relevant policies, three-level indicators were determined, and all indicators were arranged and combined to form an indicator system. The theoretical model was decomposed into specific quantitative indicators, At the end, "upward induction" - debugging the theoretical model based on specific quantitative indicators. Analyze the primary and secondary dimensions of the architecture from a theoretical perspective, establish the secondary and tertiary indicators of the architecture through policy text, relevant literature analysis, and system element validation, and then adjust the secondary dimensions based on the classification of the tertiary indicators, embedding the primary dimension. After layer upon layer inspection and three rounds of distribution, the final version was formed.

3.1 Reliability Analysis

In order to truly reflect the participants' views on the importance of the quality indicator system for kindergarten teachers' work environment, this study mainly adopts Cronbach's α to conduct internal consistency reliability tests on coefficients and split half reliability coefficients. The test results are shown in Table 1. The Cronbach α questionnaire on the quality of the working environment for kindergarten teachers was compiled by ourselves α The total reliability is 0.971, and the total score half reliability is 0.891 α The coefficient and half coefficient are both above 0.80, indicating that the formal version of the survey questionnaire on the quality of kindergarten teachers' work environment and the internal consistency reliability of each dimension are good and can be used.

TABLE I. Reliability Coefficient Of Each Dimension Of The Indicator System

	Work space	Management system	Work culture	Social support	Professional development	Overall indicators
Crobach α	0.878	0.925	0.932	0.964	0.925	0.977
Split-half	0.883	0.898	0.889	0.868	0.889	0.891

3.2 Validity

Convergence validity refers to the degree to which test indicators that measure the same latent trait (construct) may fall on common factors, that is, different measurement methods should be aggregated in the measurement of the same feature. (Wang chongming, 1990) Confirmatory factor analysis often uses AVE and CR as two indicators for convergence validity analysis. In this study, the AVE values for the five dimensions were 0.506-0.671; The CR value is 0.887-0.946, which meets the criteria of AVE>0.5 and CR>0.7 for each factor in statistics, indicating good convergence validity for each dimension

TABLE II.   Model AVE and CR indicator validity results

Model AVE and CR indicator results		
Factor	AVE extracted from mean variance	Combined reliability CR
Work space	0.506	0.887
Management system	0.555	0.924
Work culture	0.671	0.910
Social support	0.664	0.946
Professional development	0.614	0.917

3.3 Confirmatory Factor Analysis

To further validate the structure of the work environment quality of kindergarten teachers, researchers used Amos 22.0 to conduct confirmatory factor analysis on various indicators under workspace, management system, kindergarten culture, social support, and professional development, and to test the fitting degree of each indicator. The indicators refer to Professor Wu Minglong's (2010) view on fitting indicators, and the adjusted results of each fitting indicator in the model are shown in Table 3.

TABLE III.   Confirmatory factor analysis fitting index ANALSIS

Statistical inspection quantity	Standards	Model verification value				
		Work space	Management system	Work culture	Social support	Professional development
Absolute fitness index						
x^2	P>0.05	0.179	0.131	0.282	0.176	0.127
SRMR	<0.05	0.021	0.029	0.025	0.030	0.055

Statistical inspection quantity	Standards	Model verification value				
RMSEA	<0.10	0.085	0.073	0.050	0.031	0.065
GFI	>0.90	0.982	0.958	0.977	0.901	0.921
Value added adaptation value						
NFI	>0.90	0.988	0.964	0.981	0.948	0.913
IFI	>0.90	0.995	0.943	0.996	0.956	0.920
TLI（NNFI）	>0.90	0.985	0.978	0.992	0.910	0.908
CFI	>0.90	0.995	0.987	0.977	0.955	0.919
Minimalist Fit Index						
AGFI	>0.90	0.912	0.901	0.930	0.904	0.922
x2/df	<5.00	1.722	2.823	1.251	4.723	3.693

4. Discussion

This study focuses on the development of a quality indicator system for the working environment of kindergarten teachers. 450 kindergarten teachers in H region of Hebei Province, China were selected as the research subjects. Based on the organizational atmosphere theory, a quality indicator system for the working environment of kindergarten teachers was developed. After three rounds of testing, a formal evaluation scale was issued. SPSS 22.0 was used for basic statistical analysis and regression analysis. After data testing, it was found that: based on the organizational atmosphere theory, The quality of the working environment for kindergarten teachers can be divided into five dimensions: workspace, management system, kindergarten culture, social support, and professional development, including 16 constituent elements and 40 tertiary indicators.

The preparation process of the indicator system relies on policy text and interview data coding, combines theory to extract indicators and dimensions, and conducts fitting effect testing through three rounds of questionnaire distribution. In the final data analysis, the indicator system has achieved good reliability and validity, and exploratory factor analysis and confirmatory factor analysis have both performed well, with a certain degree of scientificity.

5. Limitation

Due to the limited abilities of the researchers, there are some shortcomings in the design of this study. Firstly, the design of the indicator system mainly relies on the cultural characteristics of the northern region of China. During the research process, the distribution and testing of questionnaires were only conducted in the northern region, so there may be certain cultural characteristics. Further analysis and discussion are needed on whether it can be applied to the testing of the work environment quality of preschool teachers in different regions of China. Secondly, in the process of compiling the questionnaire, there is a certain lag in the policies and text analysis used, and in the future, flexible adjustments need to be made based on practice and new policies.

Acknowledgment

References

[1] OECD. Teachers matter: attracting,developing and retailing ettective teachers [EB/OL].(2005-06-08) [2021-09-01]. https://doi.org.org./10.1787/9789264018044-en.

[2] OECD. Teachers well-being:a framework for data collection and analysis [EB/OL].(2020-01-30)[2021–09-01].https://doi.org/10.1787/c36fc9d3-en.

[3] FETTTERMEND M.Foundations of Empowerment Evaluation[M]. Thousand Oaks,CA: Sage,2001.

[4] OECD.Providing Quality Early Childhood Education and Care:Results from the Starting Strong Survey 2018[R]. Paris:OECD Publishing,2019.

[5] International Labour Office. (2014). ILO Policy Guidelines on the promotion of decent work for early childhood education personnel.https:// www.ilo.org/wcmsp5/groups/public/@ed_dialogue/@sector/documents /normativeinstrument/wcms_236528*1.pdf.

[6] Diamantopoulos A, Winklhofer H M. Index Construction with Formative Indicators:An Alternative to Scale Development[J].Journal of Marketing Research, 2001,38(2).

[7] Wu Minglong. Structural equation model: operation and application of AMOS [M]. Chongqing: Chongqing University Press, 2010: 37

[8] Wang Zhongming. Psychological Research Methods [M]. Beijing: People's Education Press, 1990: 319.

[9] Cumming T, Wong S, Logan H. Early childhood educators' well-being, work environments and 'quality': Possibilities for changing policy and practice. Australasian Journal of Early Childhood. 2021;46(1):50-65.

[10] Chen Dezhi, Li Kejian, Zhou Jing Surveying attribute analysis of Towards Quality -- Evaluation Standard of China's Kindergarten Education Quality -- based on the evaluation data of 100 kindergartens and 1670 children in China [J]. Preschool Education Research, 2021 (01): 3-16

[11] EUROPEAN UNION.Council Recommendation on 22 May 2019 on High-Quality Early Childhood education and care system[Z].UnionE.Official Journal of the European Union.https:// eur-lex.europa.eu/l egal-content/EN/TXT/PDF/?uri= CELEX :32019H0605(01)&from=EN

[12] Paula Jorde-Bloom, Assess the climate of your center: Use the early childhood work environment survey[J]. 1988, 15(4):9-11.

[13] Wong, Yau-Ho P . Development of a work environment rating scale for kindergarten teachers[J]. Occupational medicine, 2015.

[14] Johnson B, Stevens J J, Zvoch K. Teachers'perceptions of school climate: A validity study of scores from the Revised School-Level Environment Questionnaire[J]. Educational & Psychological Measurement, 2007,