

A Study on the Construction and Integration Degree Measurement of the Evaluation Index System for Integrating Red Revolutionary Spirit into Preschool Dance Courses Based on the Problem-Based Learning Model

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ABSTRACT The red revolutionary spirit is an important component of value education, and its integration into preschool dance courses is a key issue in curriculum-based ideological and political education reform. Based on the problem-based learning model, this study constructs an evaluation index system and integration-degree measurement tool for integrating red revolutionary spirit into preschool dance courses. Three kindergartens are selected as research samples, and six middle and senior classes involving 156 children participate in the empirical study. Dance projects are designed around themes such as patriotism, dedication, unity, and struggle, and are implemented through project launch, project exploration, project presentation, and project reflection. A multidimensional evaluation system is constructed using literature analysis, Delphi consultation, and analytic hierarchy process, covering goal integration, process integration, and effect integration. The results show that the PBL-based integration of red revolutionary spirit significantly promotes children's participation awareness, expression awareness, and cooperation awareness, and achieves good ideological and political education effects. The study provides a measurable evaluation framework for preschool dance curriculum reform.

INDEX TERMS PBL model, red revolutionary spirit, preschool education, dance curriculum, evaluation index system

I. INTRODUCTION

PRESCHOOL education serves as the fundamental loom of the national system, where the enduring spirit of craftsmanship is integrated to strengthen the essential formation of children's cognitive structures and moral values. In recent years, as the country adhering to the construction of high-quality preschool education, the idea of introducing ideological and political education from preschool education curriculum gradually spanned to the preschool education stage. The spirit of the revolution, as a spiritual asset valuable in the form of the Communist Party of China leading the people in the process of revolution, construction and reform, has obvious value orientation, and educational function. Integration of the spirit of the revolution in preschool education curriculum not only helps the kids in developing the spirit of patriotism and sense of collectivism in the initial stages, but pathways of value education are laid in the later stages as well.

Dance courses as an important form of arts education in preschool education, also have multiple functions, such as physical expression, aesthetic experience, and emotional education. Compared to language courses, dance courses have a focus of physical participation and emotional resonance, as they have strong experiential and infectious values, and thus make them an ideal means for the integration of revolutionary spirit. However, existing preschool dance courses still have such defects as fragmented content, monotonous forms and vague evaluation in the integration of revolutionary spirit, and there are no systematic integration pathways and scientific evaluation tools.

Project-based learning (PBL) is task-driven by actual problems, it is focused on children active constructing knowledge through exploration and practice, and it possesses the characteristics of integrative, process-oriented, and cooperative characteristics. Introducing PBL into dance courses can give the contextualized teaching framework of

integrating revolutionary spirit, where children experience, express, and internalize revolution values through the completion of dance projects. However, how to scientifically assess the quality of revolutionary spirit integration under the PBL model and how to measure the degree of integration of revolutionary spirit in the dance courses are the major problems in the course of present research. Therefore, this study attempts to build up a set of the ideological and political quality evaluation indicators suitable for preschool dance courses under the PBL model, and the design of integration measurement tool attempts to verify the scientific validity and operability of the measurement tool through empirical research. These research results provide a theoretical and practical foundation for the ideological reform of preschool dance courses, utilizing the structural logic of distribution to achieve a systematic integration and quantifiable evaluation of revolutionary spirit.

II. RELATED WORK

While existing literature [1-4] extensively discusses general strategies for improving preschool education quality through integrative methods and teacher competence, there is a notable lack of research specifically addressing the intersection of value-based education and kinetic arts. This study moves beyond general quality frameworks to address the specific structural gap in assessing ideological integration within specialized dance curricula. Mutanga [5] adopted a qualitative research method. Through in-depth interviews with students, their subjective experiences, feelings and cognitions in the process of project-based learning were collected, and the conclusions presented students' multi-dimensional perspectives on project-based learning. Based on the understanding that the development of executive function in 5-year-old children during the preschool stage has an important impact on their overall learning and participation, Deshaies and Éthier [6] explored how the development level of inhibitory control ability of 5-year-old children affects their participation quality in the preschool education environment. Rehani and Mustofa [7] observed and evaluated students' critical thinking performance in the project process by carrying out specific project-based teaching activities at SMK Negeri 1 Surakarta School. Aziz and Nurachadijat [8] combined theoretical discussions to construct a theoretical framework and mechanism for project-based learning to promote the development of students' various learning skills. Ahmad *et al.* [9] revealed the overall picture of project-based learning research in vocational education. Arochman *et al.* [10] concluded that project-based learning has a significant positive impact on the English writing skills of Indonesian EFL learners. In terms of subject coverage, the dance course in the preschool education stage, as a special field that integrates aesthetic education, body expression and value guidance, still lacks research on its quality evaluation system. Based on this, this study explores the theoretical path and practical model of organically integrating the spirit of the revolution into

preschool dance courses within the framework of project-based learning. It constructs an operable evaluation index system for ideological and political education quality and scientifically measures its integration degree, aiming to provide theoretical basis and practical reference for the reform of ideological and political education in preschool education courses.

III. METHODS

A. SELECTION AND BASIC INFORMATION OF RESEARCH SUBJECTS

This study selected three kindergartens in a city that offer preschool dance courses as research samples. All three kindergartens are city-level demonstration kindergartens with relatively complete dance curriculum programs and teachers possessing certain curriculum development capabilities. The selection of research subjects followed the principles of representativeness and feasibility, ensuring that the samples could reflect the general situation of preschool dance courses. The three kindergartens are located in the city center, the urban-rural fringe, and the suburbs, respectively, exhibiting certain differences in student composition, teacher allocation, and curriculum resources, which helps to improve the generalizability of the research conclusions.

In three kindergartens, one middle class and one senior class were selected from each as experimental classes, for a total of six classes and 156 children. The sample was evenly distributed into four sub-groups for comparative analysis: 39 Middle-class boys, 39 Middle-class girls, 39 Senior-class (Kindergarten) boys, and 39 Senior-class (Kindergarten) girls ($n=39$ per group). All participants had an average age of 5.2 years. All class teachers were graduates of preschool education and had more than three years of teaching experience. Dance courses were taught by full-time dance teachers or class teachers with dance expertise. All teachers involved in the research received preliminary training on the PBL teaching model and the integration of Red Revolutionary Spirit to ensure the standardization of teaching implementation [11-12]. The 'Red Revolutionary Spirit' is defined herein as a specific ideological framework of revolutionary heroism, collective sacrifice, and national resilience derived from the history of the Communist Party of China. Informed consent was obtained from all participants or their legal guardians.

B. INSTRUCTIONAL DESIGN FOR INTEGRATING RED REVOLUTIONARY SPIRIT INTO DANCE COURSES UNDER THE PBL MODEL

This study's instructional design uses the Problem-Based Learning (PBL) model as its core framework, designing a series of dance projects centered around the core connotations of the "Red Revolutionary Spirit." The selection of Red Revolutionary Spirit elements focuses on "patriotism, dedication, unity, and struggle" as the main dimensions, combining children's cognitive characteristics and life experiences to transform the Red Revolutionary Spirit into

content that children can perceive, express, and perform. Specific project themes include “I Love My Motherland,” “Little Red Army Soldiers Crossing the Grasslands,” “Unity is Strength,” and “Industrious Little Bees,” etc. Each project lasts four to six weeks, with two to three dance activities per week, each lasting 25 to 30 minutes.

Each project unfolds according to the basic process of PBL model: the first stage is the project launch, where teachers present a core situational challenge, such as ‘How can we use our bodies to show the difficulty of a long journey without using words?’, picture display, video playback, etc., to stimulate children’s interest and initially perceive the connotation of the Red Revolutionary Spirit; the second stage is project exploration, where children solve this expressive problem by collaborating to design specific formations and movement sequences that represent overcoming obstacles, effectively transitioning from simple role-play to collaborative problem-solving in creative choreography; the third stage is the project presentation, where children present their dance works in groups, and teachers and peers conduct interactive evaluations; the fourth stage is the project reflection, where teachers guide children to review the project process, express their feelings and gains, and further internalize the Red Revolutionary Spirit [13].

In the instructional design, emphasis is placed on integrating the spirit of the Red Army into every aspect, including dance movements, music selection, prop usage, and scenario creation. For example, in the “Little Red Army Soldiers Crossing the Grasslands” project, teachers guide children to imitate the movements of Red Army soldiers climbing snow-capped mountains and crossing grasslands, accompanied by the melody of the revolutionary song “Ten Farewells to the Red Army,” using red ribbons as props to create a revolutionary atmosphere, allowing children to experience the resilience and bravery of the Red Army soldiers through physical participation. In the “Unity is Strength” project, teachers design cooperative dances, emphasizing coordination and cooperation, enabling children to understand the meaning of unity through collaboration.

C. CONSTRUCTION OF THE IDEOLOGICAL AND POLITICAL EDUCATION QUALITY EVALUATION INDEX SYSTEM

The construction of the ideological and political quality evaluation index system follows the principles of scientificity, systematicness, and operability, and adopts a combination of literature analysis, expert consultation, and analytic hierarchy process. First, through literature analysis, relevant research results on preschool education quality evaluation, dance course evaluation, and curriculum-based ideological and political education evaluation are sorted out, and preliminary indicators are extracted. Second, ten experts in the fields of preschool education, dance education, and ideological and political education are invited to conduct two rounds of Delphi consultation to screen and revise the indicators. Finally, the weight of each indicator is

determined by using the analytic hierarchy process [14-15]. Through AHP calculation, the weights for the first-level indicators were assigned as: Goal Integration ($W_1 = 0.35$), Process Integration ($W_2 = 0.40$), and Effect Integration ($W_3 = 0.25$). Within these dimensions, the nine second-level indicators were assigned weights ranging from 0.08 to 0.15 based on expert consistency rankings. This weighted framework provides the mathematical basis for the ‘Overall Integration’ scores presented in the results.

The evaluation index system is divided into three levels: the first-level indicators include three dimensions: goal integration, process integration, and effect integration; the second-level indicators are further subdivided under the first-level indicators, totaling nine indicators; and the third-level indicators are further refined, totaling twenty-seven observation points. The goal integration dimension includes three second-level indicators: value orientation, cognitive goals, and emotional goals, which respectively examine the degree to which the spirit of the revolution is reflected in the curriculum goals, children’s cognitive level of the spirit of the revolution, and children’s emotional identification with the spirit of the revolution. The process integration dimension includes three second-level indicators: activity design, teacher guidance, and children’s participation, which respectively examine the degree to which the activity content aligns with the spirit of the revolution, the teacher’s guidance methods and effects on the spirit of the revolution in the activities, and children’s active participation and emotional expression in the activities. The effect integration dimension includes three second-level indicators: performance in the work, behavioral changes, and value internalization, which respectively examine the degree to which the dance work expresses the spirit of the revolution, how children embody the spirit of the revolution in their daily behavior, and the degree to which children have initially internalized the spirit of the revolution.

The third-level indicators refine the second-level indicators into measurable observation points. To differentiate between simple physical mimicry and genuine internalization, the ‘Value Internalization’ dimension specifically assesses children’s ability to autonomously narrate the moral significance of their movements during the post-activity reflection stage (Stage 4), rather than solely evaluating the accuracy of imitated dance steps. observation points include ‘emotional resonance,’ which is operationalized as children maintaining focused eye contact, rhythmic synchronization with the music’s tempo, and the use of ‘high-energy’ facial expressions (e.g., smiling or determined looks) consistently throughout the performance. These markers provide a standardized behavioral metric for ‘positive emotion’ within the five-level scoring system. Each observation point uses a five-level scoring system, with scores ranging from 1 to 5 points, from “completely disagree” to “completely agree.”

D. DESIGN AND RELIABILITY AND VALIDITY TESTING OF INTEGRATION MEASUREMENT TOOLS

The integration measurement tool was designed on the basis of an evaluation index system, which transformed the three-level indicators into the measurement items to form the "Questionnaire for Measuring the Integration of Red Revolutionary Spirit into Preschool Dance Courses." The questionnaire was split into a version that the teachers completed and one that was completed by observers. The teacher version was completed by teachers in the experimental class following each project and the observer version was completed by three trained researchers who observed and completed the projects in the presentation phase. The questionnaire consisted of twenty-seven items, each of which corresponded to an observation point, and a scoring system using five levels.

To determine the reliability and validity of the measurement tool, a pretest was conducted in the study before the final study. The pretest was done in a senior class in a kindergarten with 26 children who took part. The other two researchers along with the class teacher completed the questionnaire. After collecting the pretest data, reliability analysis was done in using the SPSS software to calculate the Cronbach's alpha coefficient. The results revealed that alpha coefficient for the teacher version of the questionnaire was 0.89 and alpha coefficient for the observer version was 0.87, which were higher than 0.8, and it had high internal consistency reliability. Validity was tested in terms of content validity index and factor analysis. The content validity index was calculated including the 10 experts in rating the fit between the questionnaire items and the observation points, and an average CVI of 0.92 was calculated, indicating good content validity. Factor analysis indicated evidence of good convergent validity and discriminant validity among the items of the questionnaire for the three pre-specified dimensions.

E. DATA COLLECTION AND PROCESSING

The formal research lasted one semester, totaling eighteen weeks. After each project, teachers from the experimental classes completed the teacher version of the questionnaire, while three researchers observed the projects during the presentation and completed the observer version. Simultaneously, the researchers videotaped the teaching process for each project as supplementary data for subsequent analysis. By the end of the semester, a total of 72 teacher version questionnaires (six classes $\times$ four projects) and 216 observer version questionnaires (three observers $\times$ six classes $\times$ four projects) were collected.

IV. RESULTS AND DISCUSSION

A. OVERALL SITUATION OF THE INTEGRATION OF RED REVOLUTIONARY SPIRIT

Statistical analysis of integration data from four projects across six classes was conducted to determine the overall integration of revolutionary spirit into preschool dance

courses. Table 1 shows the average scores for each class across the three dimensions of goal integration, process integration, and outcome integration.

TABLE 1. Scores of each dimension of the integration of the "Red Revolutionary Spirit"

Class	Target integration dimensions	Process Integration Dimensions	Effects integrated into dimensions	Overall integration
Class A (Middle Class)	4.12	3.98	3.85	3.98
Class A	4.35	4.28	4.15	4.26
Class B	3.98	3.87	3.76	3.87
Class B	4.21	4.15	4.02	4.13
Class C	4.05	3.92	3.81	3.93
Class C	4.28	4.21	4.08	4.19
population mean	4.17	4.07	3.95	4.06

As shown in Table 1, the overall mean score of integrating the revolutionary spirit through the 6 classes was 4.06 which is relatively high. The goal integration dimension showed the highest score of 4.17 which showing that the teachers were effective in reflecting the value orientation of revolutionary spirit in formulating curriculum goal. The process integration dimension was second highest with 4.07, and it appeared that the integration of revolutionary spirit comes fairly naturally and effectively to the design of activities and the guidance from teachers. The result of the outcome integration dimension obtained a relatively low score with an average of 3.95 that indicated that there is still room for improvement in children's performance in their artwork, behavioral changes, and value internalization.

From the point of the class type, the senior class had a higher score than the middle class in all dimensions. Class A (senior class) had the most overall integration rate at 4.26, and class B (middle class) the lowest with a rate of 3.87. This result shows that with age and cognitive development, children in the senior class have a better understanding and expression of the spirit of patriotism and so this integration effect is more significant. From the point of view of kindergarten type, Kindergarten A (urban center) had a little better score than Kindergarten B (urban-rural fringe) and Kindergarten C (suburban area) in all these aspects but the result was not significant. This indicates that a good level of integrating of the three kindergartens in respect of the spirit of patriotism and the regional differences did not have a major impact on the rate of integration.

B. COMPARISON OF INTEGRATION DEGREES OF DIFFERENT PROJECT TYPES

To further analyze the impact of different project themes on the integration of revolutionary spirit, a comparative analysis of the integration scores of the four projects was conducted. The four projects were "I Love My Motherland," "Little Red Army Soldiers Crossing the Grasslands," "Unity is Strength," and "Industrious Little Bees," corresponding to the four dimensions of revolutionary spirit: patriotism, struggle, unity, and dedication. The mean scores of each project in the three dimensions of goal integration, process integration, and effect integration are shown in Table 2.

TABLE 2. Comparison of Integration Scores for Different Project Types

Project Theme	Target integration dimensions	Process Integration Dimensions	Effects integrated into dimensions	Overall integration
I love my motherland	4.32	4.18	4.05	4.18
Little Red Army soldiers crossing the grasslands	4.28	4.25	4.12	4.22
Unity is strength	4.15	4.09	4.02	4.09
Industrious Little Bee	3.92	3.76	3.61	3.76
population mean	4.17	4.07	3.95	4.06

As can be seen from Table 2, there are certain differences between the four projects in terms of the degree of integration of the Red Revolutionary Spirit. The “Little Red Army Crossing the Grasslands” project has the highest overall integration degree and is 4.22, the “I Love My Motherland” project is the overall integration degree of 4.18, the “Unity is Strength” project is the overall integration degree of 4.09, and the “Industrious Little Bee” project has the lowest degrees of overall integration of 3.76.

The project “Little Red Army Soldiers Crossing the Grasslands” had the highest score in both process integration and outcome integration dimensions which were 4.25 and 4.12 respectively. Set against the backdrop of the Red Army’s Long March, there are strong dramatic and contextual elements to the project. Children have a high level of physical involvement and intense emotional investment as they reenact Red Army soldiers climbing snow-covered mountains and crossing grasslands, and as such it is easier for them to identify with the lessons. Teachers mixed the activities with stories of Red Army and revolutionary songs, and this would create a rich atmosphere and make the integration of the revolutionary spirit easier and profound. The “Industrious Little Bee” project scored the lowest especially in integrating dimension where they only scored 3.61. While the theme of the project is diligence and has some correspondence to the spirit of hard work, the content design had a weak relation to the spirit of communism. Children were more focused on imitating what bees were doing collecting nectar, but they did not understand the spirit of hard work itself. This result was found to suggest that in choosing the themes of project, priority should be given to project whose degree of affinity to the spirit of communism is high, which thematic has high contextuality and is easy to understand and express by young children to avoid a gap between theme and the spirit of communism.

C. ANALYSIS OF THE INFLUENCE OF CHILDREN'S AGE AND GENDER ON INTEGRATION

To explore the influence of children’s age and gender on the integration of revolutionary spirit, a comparative analysis was conducted on the scores of children of different age groups and genders on the dimension of effective integration. The dimension of effective integration includes three secondary indicators: artistic performance, behavioral changes, and value internalization, which can directly reflect the degree to which children accept and internalize revolutionary spirit. The mean scores of children of different age groups and genders on the dimension of effective integration are shown in Table 3.

TABLE 3. Comparison of integration scores for children of different ages and genders

Group	Works of art	Behavioral changes	Value internalization	Effects integrated into the overall average score
Middle class boys	3.72	3.58	3.45	3.58
Middle class girls	3.98	3.82	3.71	3.84
Kindergarten boys	4.08	3.95	3.86	3.96
Kindergarten girls	4.32	4.21	4.12	4.22
population mean	4.03	3.89	3.79	3.90

Table 3 reveals that senior class children in kindergarten scored higher than middle class children on all indicators of integration into the performance but girls scored higher than boys on all the indicators. In the point of perform, the highest group was senior class girls (4.32 points) and the lowest point of perform was middle class boys (3.72 points) a big difference. This result shows that the balance of children’s growth, including body control, movement expression, and emotional expression all have improved with age; hence, the child is able to accurately express the spirit of patriotism through dance performances. Furthermore, girls showed more enthusiasm and desire to perform in dance activity, exhibited more fluid movements and richer expressions, hence scored higher in terms of performance.

In respect of behavioral manifestation indicators, senior kindergarten girls had the highest score of 4.21 and middle kindergarten boys had the lowest score of 3.58. Behavioral change mainly addresses the children’s ability to live up to the spirit of communism through daily behavior such as actively assisting others in a group, sharing toys, and following group rules. The better score by the senior kindergarten girls may be linked to their earlier social development and more powerful peer interaction skills. The lower score of the middle kindergarten boys recommends that the next teaching on this group should work on the behavior guidance that can promote the transformation of communism into their daily behavior through their positive reinforcement and role modeling.

Regarding the value internalization indicator, the values for all the groups were generally lower than work performance and behavioral change. The best score was senior kindergarten girls (4.12) and the worst score was middle kindergarten boys (3.45). Value internalization mainly focuses on the extent of children’s initial internalization of the spirit of the revolution that is, under teacher guidance, can recite related vocabulary, are able to express the admiration of heroic figures. This result agrees with the patterns of children’s cognitive development; it is associated with a relatively long time of immersion and accumulation for value internalization. The lower scores in the effect integration dimension in comparison to the goal integration and process integration dimensions is also related to this.

V. CONCLUSION

Guided by the Problem-Based Learning (PBL) model, this research explores the integration of revolutionary spirit into preschool dance curricula by drawing parallels to the enduring craftsmanship and resilience found in traditional heritage, investigating how these cultural pathways impact early

childhood development. It built a comprehensive evaluation index system for the quality of ideological and political education with three dimensions (goal integration, process integration and outcome integration), nine secondary indicators and twenty-seven observation points, and designed a measurement tool for integration degree. Through empirical research over one semester in six classes of 3 kindergartens, the reliability and validity of the evaluation index system and the measurement tool were confirmed, and the actual degree of revolution spirit implementation of the dance curriculum was quantified.

The research results give an answer that it is highly feasible and effective to integrate the spirit of the revolutionary history in preschool dance courses based on the Project-Based Learning model (PBL). All the classes scored highly on the three dimensions of integration - goal integration, process integration and outcome integration. Different types of projects demonstrated different levels of integration and those that were more contextual and related to revolutionary history were better integrated. Children's age and gender significantly became factors of integrating effect and the younger age and girls achieved higher scores in the dimension integrative outcome.

This study gives the theoretical support and practical reference to the ideological and political construction of dance course in pre-school education. The evaluation index system constructed and the tools for measuring integration can serve as the reference for further research and teaching practice. Future studies should expand the sample scope and intervention period to examine the home-school co-education mechanism, utilizing the intergenerational transmission of craftsmanship as a medium to promote the systematic integration and quantifiable evaluation of revolutionary spirit within preschool education.

AUTHOR CONTRIBUTIONS

Conceptualization – Shuang Hu, Qingyao Liang, Dan Wu, Fang Wang and Yanyan Cao; methodology – Shuang Hu, Dan Wu, Fang Wang and Yanyan Cao; investigation – Shuang Hu, Qingyao Liang, Dan Wu, Fang Wang and Yanyan Cao; writing-original draft preparation – Shuang Hu, Qingyao Liang, Dan Wu, Fang Wang and Yanyan Cao. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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