# Research on Practical Dilemma and Path Optimization of Online-Merge-Offline Education in Kindergarten

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**Abstract.** With the advancement of informatization in China entering a new stage, the field of preschool education is increasingly undergoing digital transformation. This study focuses on in-service teachers and pre-service preschool education students as its participants, and examines the practical challenges and developmental pathways of online-merge-offline teaching in kindergartens. The findings indicate that both in-service teachers and pre-service college students lack adequate professional knowledge for implementing online-merge-offline teaching, and that notable differences exist between the two groups; the practice of online-merge-offline teaching in kindergartens remains at an early stage and continues to face multiple challenges; and a gap exists between preschool teachers' and pre-service students' conceptual understanding of online-merge-offline teaching and their actual classroom practices. In the future, kindergartens could explore and optimize online-merge-offline education through enhancing teachers' professional development and improving the construction of digital resources. The purpose of this study is to offer practical insights for the digital transformation of preschool education, as well as to provide an empirical basis for policymaking and the development of educational resources.

**Keywords:** Kindergarten, online-merge-offline education, digital education, preschool education, preschool teachers

## 1 Introduction

In recent years, the development of information technology in China has entered a new stage. The 14th Five-Year National Informatization Plan initially introduced the concept of "lifelong digital education" and outlined a series of specific requirements for advancing educational digitalization[1]. The digital transformation of education has become central to current educational reform, with digital technologies serving as a new driving force for the high-quality development of education. In this context, the Online-Merge-Offline (OMO) education not only enhances the accessibility of kindergarten educational resources but also overcomes the temporal and spatial limitations of traditional teaching, offering a new pathway to narrowing regional disparities and advancing


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inclusive development. This trend also aligns with the policy of "addressing the shortfall of inclusive resources" articulated in the Action Plan for the Development and Improvement of Preschool Education during the 14th Five-Year Plan [2]. Nevertheless, existing research on OMO teaching has primarily concentrated on primary, secondary, and higher education, with limited attention given to practices at the kindergarten level. In practice, kindergartens encounter multiple challenges in implementing OMO teaching, including unequal resource allocation, limited teacher capacity, and difficulties in home–school coordination. Promoting the effective implementation of the OMO education in preschool education has therefore become an urgent issue requiring resolution. This study aims to offer practical insights for the digital reform of preschool education by examining the challenges and potential optimization strategies faced by kindergartens in adopting the OMO education.

## 2 Literature Review

Online-merge-offline education refers to the organic combination of traditional offline education and online education to form an educational ecosystem that complements and promotes each other.[3]. In recent years, with the continuous advancement of digital transformation of education, OMO education has shown broad development prospects. It can support real-time interaction between teachers and students through digital technology, enrich the forms of interactive communication, and enhance the flexibility and openness of teaching practice.[4]. In addition, OMO teaching can integrate diverse learning resources in industrial training teaching, and a quasi-experimental study in Iran shows that it can significantly improve students' learning effect.[5]. An OMO education pilot project in the post-epidemic era in China also verified the value of this teaching model in breaking through the limitation of learning space, which can help promote the sustainable development of education in the future.[6]. However, the implementation of OMO education model also faces challenges, among which teachers' professional quality and educational concept are the key factors affecting its effectiveness. Studies have shown that there is a significant gap between teachers' actual competence and the requirements of carrying out OMO education practice, which is manifested in teachers' low acceptance of information technology, insufficient motivation to participate in reform and weak willingness to invest in new models. Therefore, teachers' adaptability to the digital transformation of education should be improved.[3]. In addition, teachers' cognition of OMO education mode is biased, and they still stick to the traditional offline teaching method, which leads to their failure to give full play to the potential advantages of promoting students' autonomous learning.[7]. It is particularly noteworthy that teachers' own knowledge level is also a key factor that affects students' satisfaction with OMO teaching, and plays an important role in improving the OMO teaching impacts.[8].

In the pre-school education stage, it is an important way for kindergartens to promote the implementation of OMO teaching by creating specific educational situations to stimulate teachers' enthusiasm for participating in educational reform, thus improving teachers' data thinking ability.[9]. However, due to the lack of suitable digital resources

and platforms, kindergartens are facing great challenges in OMO teaching practice. At present, there is a serious mismatch between the online resources of OMO teaching and children's needs, and it is difficult for young children to operate online platforms, and the resource database generally lacks a refined screening mechanism for children's cognitive characteristics.[10]. In addition, the existing pre-school digital education resources are mainly for teachers, while the resources that directly serve children's learning and development needs and parents' support needs are scarce and of low quality.[11]. A study also clearly pointed out that teachers' insufficient ability to use information and communication technology (ICT) and infrastructure, as well as the general lack of child-friendly design of online platforms, seriously restricted the effective support for young learners.[12]. At the same time, although parents generally support children to use information technology equipment and resources appropriately, they have a vague understanding of OMO education model and lack of effective home-school coordination mechanism, which makes it difficult to deepen home cooperation in OMO education practice.[13].

Although research on OMO education has made some progress, studies focusing on kindergartens remain underdeveloped, with many aspects still requiring in-depth exploration. OMO practices in kindergartens face multiple interrelated challenges: teachers' professional competence and motivation for reform are limited; child-friendly digital resources are scarce, creating a supply–demand imbalance; platforms often lack child-centered design; and mechanisms for home–school coordination remain inadequate. These challenges constitute the core bottlenecks hindering the development of OMO education in kindergartens. Therefore, this study draws on the realities of kindergarten teaching to analyze the practical challenges and potential optimization strategies in applying the OMO model, offering practical insights for the digital reform of preschool education and providing an empirical basis for educational authorities and enterprises to develop appropriate resources.

## 3 Research Design

This study adopts a qualitative research design employing semi-structured interviews to gain an in-depth understanding of the experiences and perspectives of preschool teachers and normal university students in implementing Online-Merge-Offline (OMO) education in kindergartens. By capturing participants' subjective perceptions and practical reasoning in authentic contexts, the study provides contextual evidence and improvement strategies for the implementation of OMO teaching in kindergartens.[14]. Following the principle of purposive sampling, the study selected five preschool teachers from H Park, a provincial-level public kindergarten, and four normal university students from Z School, a provincial normal university, as its participants. The kindergarten has a relatively strong foundation in educational informatization, and its teachers possess practical teaching experience. As prospective preschool teachers, the preservice students provide insights and expectations for OMO teaching from the dual perspectives of learners and potential implementers.

Semi-structured interviews were employed in this study. The interview outline was designed based on the previous research and combined with the key dimensions such as teachers' professional development, technical support and teaching adaptation, which mainly included the cognitive level, practical experience, difficulties and challenges, and suggestions for improvement. In this study, pre-interviews were conducted before formal interviews, and the expression of questions and the order of questions were optimized according to feedback. All interviews are conducted in a one-on-one way, each interview lasts about 15-30 minutes, and recorded with the consent of the participants. After the interview, the recorded materials were transcribed into texts, forming a transcribed manuscript of about 22,000 words, which was confirmed by the interviewees to ensure the accuracy of the information.

In this study, grounded theory is used for data analysis. Grounded theory is a typical qualitative analysis method, which establishes theoretical categories through step-by-step coding and emphasizes theoretical construction and extraction from original data.[15]. The analysis process is divided into three stages: Open coding, spindle coding and selective coding. First of all, in the open coding stage, the researchers review the interview text sentence by sentence and extract concepts such as "insufficient cognition" and "high equipment delivery cost". Then, in the spindle coding stage, the related concepts are integrated and classified to form five core categories: Cognitive situation, teaching practice, difficult challenges, teachers' attitude and development suggestions. Finally, in the selective coding stage, the main line of analysis is constructed around the "problems and countermeasures faced by teachers and normal students in OMO teaching", and a systematic response to the research questions is gradually formed. The whole research process strictly abides by the ethical principles of research, and all the interviewees have obtained their informed consent and will be treated anonymously. The interview materials are only used for academic research, and do not involve commercial use or leakage risk.

# 4 Research Results

## 4.1 The Cognition of Online-merge-offline Teaching of Teachers And Normal University Students

On the whole, the interviewees' overall awareness of online-merge-offline teaching is insufficient. Only two normal students said that they had a "comprehensive understanding", while the in-service kindergarten teachers said that they had "insufficient understanding" or even "no understanding at all", indicating that OMO teaching is still in the initial cognitive stage in the preschool. One teacher mentioned in his answer to "whether there has been OMO teaching": "We will carry out some teaching activities online". This shows that most in-service teachers misunderstand "OMO teaching" as "online teaching", ignore its essential characteristics of "offline-oriented and online-assisted", and easily fall into the misunderstanding of "technology stacking" or "content superposition". In contrast, because normal university students have accepted systematic academic training in higher education institutions, they can understand the conno-

tation of OMO teaching more accurately. This group difference reveals the lack of relevant content in the current professional training of kindergarten teachers, and college education can be an important supplement to job preparation.

### 4.2 Practice and Challenges of Online-Merge-Offline Teaching In Kindergartens

At present, the practice level of online-merge-offline teaching in kindergartens is still shallow, and it faces multiple challenges. In terms of equipment, more than half of the interviewees responded that "they have basic equipment but lack advanced equipment". In the practical application of the equipment, the findings show that only two teachers have implemented online-merge-offline teaching, while most of the interviewees only stayed in "simply using online resources" or carrying out "pure online teaching activities". Interviewees frequently mentioned "children's interest", but such evaluations as "broadening horizons" and "new teaching ideas" which can reflect the deep educational value were rarely mentioned. "Time-consuming curriculum design" and "children's health risks" are the two most prominent challenges, and a few interviewees mentioned "parents don't understand" and "kindergartens lack advanced equipment". Although the basic equipment provided by kindergartens can primarily satisfy the OMO teaching, the lack of advanced equipment limits the development of OMO teaching. It is worth noting that the reslut shows that there are individual differences in children's ability to operate equipment. In the interview, two interviewees pointed out that "it is difficult for children to use the equipment", but at the same time, the other two interviewees thought that "the equipment is convenient and safe to operate", which indicates that the existing equipment may have insufficient adaptability to children's cognitive ability and teachers' operating habits.

In terms of the teaching effect, "children's interest" is mentioned most frequently, indicating that online high-quality teaching resources can attract children's attention. However, other deep-seated teaching values such as "broadening horizons" and "new teaching ideas" are rarely mentioned, and few teachers have really carried out OMO teaching. These show that the current practice of OMO teaching mostly stays at the superficial level of stimulating interest, and its deep-seated value of promoting children's cognition has not been effectively achieved.

To sum up, the current online-merge-offline teaching practice in kindergartens is still in the primary stage. The core problem is that, although online resources are abundant, it is limited by users' abilities, implementation costs, health risks and external support environment, so it is difficult for OMO teaching activities to effectively help children improve their cognitive ability and assist teachers to carry out teaching activities. The adaptability of equipment and children's cognitive ability directly affects the effective use of resources. At present, the OMO teaching is restricted by multiple factors such as equipment, resources and teachers' ability, and it is in the shallow exploration stage, so it needs targeted breakthroughs to promote its development.

### 4.3 Teachers and Normal University Students' Attitudes Towards Online-Merge-Offline Teaching in Kindergartens

The overall attitude of teachers and normal university students towards OMO teaching is characterized by high consensus and action differentiation. All the interviewees pointed out that "OMO teaching is the inevitable trend of future education development", which reflects the general recognition of technology empowerment education by relevant practitioners. Most of the interviewees showed a positive attitude of "supporting/willing to try" and only a few showed a negative attitude of "unwilling to try".

There are also differences in attitudes among different groups, and normal students generally show higher acceptance. All normal university students interviewed considered OMO teaching an inevitable trend and explicitly expressed their willingness to engage in its implementation. In contrast, while all in-service teachers acknowledged OMO teaching as an inevitable trend, their support was conditional. Most emphasized preconditions such as “complying with kindergarten arrangements” and exhibited a generally reluctant attitude toward experimentation. This divergence in attitudes may stem from differing concerns: in-service teachers tend to worry about the additional workload and remain cautious about potential risks, whereas normal university students focus more on the contributions of digital technology to curriculum design and innovation, making them more receptive to this teaching model. These findings suggest that the key obstacle to translating positive attitudes into concrete behavior lies in curriculum implementers’ concerns about practical costs and risk pressures. Particularly in teaching environments characterized by limited resources and heavy workloads, it is difficult for teachers to transform their recognition of OMO teaching into active practice.

### 4.4 Practical Path of Online-Merge-Offline Teaching in Kindergarten in the Future

The practical path of teachers to OMO teaching mainly focuses on the improvement of teachers' ability, the optimization of resource system construction and external support, among which the demand for professional teacher training is the most prominent. The normal university students interviewed all think that colleges and universities should add OMO teaching courses, focus on training equipment operation and resource creation, focus on integrated curriculum design and encourage innovative curriculum design. In terms of resource construction, "single and outdated online resources" and "difficulty in resource development" are the core dilemmas at the resource level. Some normal university students mentioned that the existing resources are not suitable for children, and most of them are adult, which is not suitable for children's current cognitive level. The interviewed teachers pointed out that the current resources are mostly general materials, which are not targeted at children. They think that the implementation of OMO teaching needs to develop a kindergarten-based resource platform. By integrating local cultural materials and teachers' self-made courseware, OMO teaching

with the characteristics of the kindergarten will be formed, so that teachers can participate in the construction of kindergarten-based resource pool and technological innovation research, and gradually form a replicable teaching model.

Most interviewees emphasized the need for clear policy guidance and the strengthening of home–kindergarten coordination mechanisms as the primary forms of external support. They expressed a clear demand for policy support, believing that only under the guidance of appropriate policies can existing problems be effectively addressed. It was suggested that the government should take the lead in promoting OMO teaching in kindergartens by standardizing and localizing school–enterprise cooperation, selecting enterprises experienced in early childhood education, and encouraging collaboration with universities and kindergartens to jointly develop electronic devices and online resource platforms tailored to children's cognitive levels. Schools and enterprises were also encouraged to jointly develop customized platforms that lower the technical barriers for users. At the same time, tensions in home–kindergarten cooperation often stem from conflicts in parental perceptions, highlighting the need for parents to move beyond entrenched views. Interviewees further suggested that kindergartens could gradually build consensus on the application of digital technology through parent–child digital activities that foster mutual understanding between families and schools.

## 5 Conclusion

Based on the empirical investigation of kindergartens, this study finds that the professional knowledge reserves of preschool teachers and normal university students are insufficient and there are differences between them; OMO teaching practice in kindergarten is still in the primary stage, and the challenges it faces are diversified; There is a differentiation between preschool teachers and preschool normal university students' recognition of the concept of OMO teaching and their actual actions; The above-mentioned problems have become the key factors restricting the in-depth development of OMO teaching in kindergartens, and should be explored and optimized mainly from the aspects of teachers' professional development and digital resource construction in the future. This study provides a practical reference for kindergartens to promote the development of OMO teaching, but it also has some limitations: On the one hand, due to the limitation of research samples, the interviewees are mainly concentrated in public kindergartens and normal universities in specific areas, and the universality of the research results needs to be further expanded; On the other hand, the research mainly focuses on qualitative methods, and fails to deeply track and analyze the effectiveness of OMO teaching with quantitative data, especially the lack of dynamic observation and long-term impact assessment of teaching effectiveness.

In the future, the sample scope can be further expanded to include kindergartens of different regions, types, and levels, while adopting a mixed-methods approach that integrates qualitative and quantitative research to enable more systematic discussions. Particular attention should be given to the long-term effects of OMO teaching on children's development, equity in preschool education, and teachers' professional growth. At the practical level, universities should optimize preservice teacher training systems

by systematically integrating content on OMO teaching concepts and digital tools, thereby strengthening students' understanding of and capacity to adapt to this new teaching model. Kindergartens should leverage their resource conditions and pedagogical orientations to actively explore feasible pathways for implementing OMO teaching, while promoting resource sharing and knowledge accumulation through inter-school exchanges and regional collaboration. Policymakers should further strengthen top-level design by providing institutional guarantees in areas such as standard setting, financial investment, and incentive mechanisms, thereby constructing a support system for OMO teaching characterized by multi-stakeholder collaboration and coordinated development. This study aims to provide practical references for future research and educational reform, and to contribute to the high-quality development of preschool education in the context of digital transformation.

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