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Challenges to Mobile Learning in Kindergartens: Perspectives of Female Teachers

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Abstract

With the gradual introduction of Mobile Learning (M-Learning) into kindergarten education, female teachers face multiple challenges in their teaching practice. Existing studies mostly focus on the path of technology integration and neglect the complex situation faced by female teachers in the transformation of teaching methods. To fill this gap, this paper uses Activity Theory as a framework to focus on the challenges faced by female teachers in the implementation of M-Learning in kindergartens.Through in-depth interviews with 18 female kindergarten teachers, NVivo 15 was used to summarize and categorize five themes: Identity Ambiguity, Objective Misalignment, Tool Incompatibility, Policy Constraints, Relational Disconnection and Reconfigured Division of Labor.Each type of challenge reveals the tension between technology application and educational reality. The study found that the challenges experienced by female teachers are not only limited to the tool level, but are also deeply rooted in their professional identity and socio-cultural structure. Starting from the teachers themselves, this paper systematically presents the structural challenges in M-Learning practice and provides theoretical reference and practical support for the formulation of gender-sensitive digital education policies for kindergartens in the future.

Keywords: Mobile Learning, Female Teachers, Kindergarten, Activity Theory, Qualitative Analysis

Introduction

With the continuous expansion of M-Learning in the field of education, its application in the preschool stage has attracted widespread attention. With its flexibility, portability, and interactivity, M-Learning provides new possibilities for teaching in kindergartens. Especially in the post-pandemic context, mobile devices are increasingly becoming an important supplement to classroom teaching, promoting the evolution of education models towards digitalization and personalization (Nikolopoulou, 2021; Drwish et al., 2023).

Currently, common forms of M-Learning include app-based content learning, augmented reality-assisted teaching, and mobile device-supported collaborative learning (Saputra & Aziza, 2024; Gómez-García et al., 2021), with applications involving gamified interaction, multimodal presentation, and family collaboration (Jin et al., 2023).However, despite continuous technological optimization, its effective implementation in kindergartens

still faces challenges in terms of adaptation at the teacher level and implementation pressure (Liu & Lai, 2023).

Existing research points out that teachers often encounter problems such as tool mismatch, goal conflicts, institutional constraints, and lack of support in practice (Hakim, 2024;Chen et al., 2023). However, most of the literature focuses on the macro structure and pays little attention to the dominant group of female teachers, who face unique challenges in terms of role expectations, emotional labor, and professional identity (Xie et al., 2024; Xie, Liang & Li, 2022).

This article focuses on female kindergarten teachers, constructs an analytical framework based on Activity Theory, identifies the key challenges they face in the implementation of M-Learning, fills the theoretical gap in relevant research from a gender perspective, and provides practical inspiration for the integration and optimization of educational technology in the preschool stage.

Literature Review

Activity Theory

Activity Theory is widely used to analyze systemic interactions in educational technology, especially in M-Learning practice, where it provides a theoretical tool for revealing the structural tensions behind teacher behavior. The theory consists of five basic dimensions: Subject, Object, Tool, Rules, Community, and Division of Labor (Kwong & Churchill, 2023; Yang & Kyun, 2022). Research shows that Activity Theory can effectively reveal multidimensional contradictions and systemic restructuring in educational practices in M-Learning contexts. Existing research focuses on structural mismatches between the dimensions of tools, objects, subjects, and rules (Narayan et al., 2021).In addition, the inconsistent interaction logic between tools and subjects, as well as role ambiguity and collaboration barriers in the community and division of labor dimensions, further limit the effective execution of teaching tasks (Lee et al., 2021; Tan et al., 2021).

Although the above studies have effectively applied activity theory to M-learning research in higher education and blended teaching, research on the application of this theory in preschool education combined with M-Learning is still extremely limited.

M-Learning in Kindergartens

In recent years, the application of M-Learning in preschool education has expanded to multiple dimensions, including language development, family collaboration, emotion recognition, and cooperative learning, gradually reconstructing the structure of teacher-child interaction and teaching feedback mechanisms. Research has found that online platform-based M-Learning models help improve teachers' structural coordination in subject integration and teaching organization and effectively activate children's learning motivation (AlKaabi et al., 2025).One study found that teachers generally believe that M-Learning has positive educational potential and emphasize its role in supporting teaching flexibility and promoting teacher-student interaction (Troulinaki, 2023). At the same time, M-Learning can significantly improve teachers' knowledge integration abilities, skill mastery, and teaching attitudes (Tong et al., 2023).

However, although previous studies have focused on teaching support, resource allocation, and technological awareness at the implementation level, the current literature generally ignores gender differences within the teacher group.

Methodology

This study uses phenomenological analysis in qualitative research to gain an in-depth understanding of the challenges faced by female kindergarten teachers in implementing M-Learning practices and the logic behind their experiences. The phenomenological approach emphasizes restoring the essence of individual experiences and is suitable for exploring teachers' subjective cognition and structural tensions in complex educational contexts (Vignato et al., 2021).

This study uses Activity Theory as its analytical framework, focusing on the systematic interaction between the six basic dimensions of Subject, Object, Tool, Rules, Community and Division of Labor. The research subjects were 18 female kindergarten teachers from northern and central China, all of whom had at least one year of experience in M-Learning teaching.Prior to the study, all participants signed informed consent forms, and the project proposal was approved by an ethics review committee, strictly adhering to ethical norms such as voluntary participation, data confidentiality, and protection of interviewee rights. To ensure privacy, all samples were anonymized using codes T1 to T18.Data collection was conducted through semi-structured interviews, conducted one-on-one in person, lasting approximately 30 to 60 minutes each, and recorded via voice recording. The recordings were then transcribed automatically and manually edited to form written materials.

The interview data was coded in 2-3 rounds using NVivo 15 and summarized and analyzed using Colaizzi's seven-step method: reading the text thoroughly, extracting significant statements, constructing meaning units, aggregating themes, integrating descriptions, forming essential structures, and verifying results. This process helped to ensure coding consistency, semantic saturation, and phenomenon restoration.

Result

Identity Ambiguity

This theme originates from the “Subject” dimension of Activity Theory, revealing the role tension encountered by female kindergarten teachers in the implementation of M-Learning.

In terms of role conflict, M-Learning significantly breaks down the boundaries between work and family life, with respondents generally pointing out that their professional activities “extend” beyond working hours. Teachers pointed out that

“Mobile teaching has become part of every moment of life. After work, I still have to continue teaching and responding to parents.” (T2)

“During work hours, I am a teacher, but after work, I am also a data manager and a bridge between home and school. My work scope is becoming increasingly messy and vague.”(T7)

In terms of weakened professional identity, some teachers mentioned that their teaching autonomy has been replaced by the platform's pre-set structure, and their professional initiative has significantly declined:

“The curriculum, tasks, and pace are all determined by the platform. I'm just executing them.” (T5)

"Teaching has become like following a program, and my role is becoming increasingly marginalized." (T13)

Objective Misalignment

This theme focuses on the "Object" dimension of Activity Theory, aiming to reveal the systematic disconnect between female kindergarten teachers' teaching goal construction and motivation maintenance during the implementation of M-Learning.

In terms of the Pedagogical-Technical Gap, teachers generally expressed that there was a fundamental misalignment between the design of M-Learning tools and preschool teaching goals.Teachers pointed out:

"The platform emphasizes content delivery and task completion, but we focus on how children feel, communicate, and think." (T4)

In terms of motivational imbalance, some teachers expressed that the intrinsic enthusiasm for teaching in digital teaching has been gradually replaced by external performance evaluation. The M-Learning platform's requirements for data update frequency and the display of quantitative results have reduced the space for teachers' child-centered teaching motivation. Some teachers believe that:

"I am increasingly doing it to cope with parents' scores and platform records, rather than for the sake of teaching itself." (T11)

"The sense of achievement in teaching has become very vague because we can't see the children really making progress, we only see the data." (T16)

Tool Incompatibility

This theme corresponds to the "Tool" dimension in Activity Theory, reflecting the difficulty female kindergarten teachers have in adapting to teaching media and the imbalance in resource allocation in M-Learning practice.

In terms of Excessive Tech Load, female kindergarten teachers generally face the problem of a disconnect between technical system operation requirements and traditional teaching skills. Compared to primary and secondary schools, kindergartens lack supporting technical support and dedicated personnel, requiring teachers to independently complete tasks such as equipment maintenance, content uploading, and platform integration.

"We not only have to teach, but also upload, edit, and process various technical indicators, leaving us almost no time to prepare lessons at the end of the day." (T3)

In terms of the lack of age-appropriate content, most teachers pointed out that mainstream M-Learning platforms are mainly subject-oriented and lack localized materials that are in line with the life experiences and emotional development of young children, making it difficult to support real teaching needs.

"Many videos are too fast-paced and contain too much information, which young children simply cannot keep up with." (T8)

"This content seems more like it was designed for elementary school and has nothing to do with our teaching objectives." (T10)

Policy Constraints

This theme corresponds to the "Rules" dimension in Activity Theory, revealing the institutional barriers and gender-based structural tensions encountered by female kindergarten teachers in the implementation of M-Learning.

Teachers generally reported that the current M-Learning is Assessment-Driven Tension, emphasizing visual data, results display, and user activity, while neglecting the intrinsic quality of the teaching process and child development. Teachers pointed out:
“Every day, we are rushing to complete tasks and evaluations, and we don't have time to consider what preschool children really need.” (T12)
The teachers interviewed pointed out the lack of gender-sensitive support, which fails to provide female teachers with substantial assistance in terms of technology adaptation, time allocation, and psychological support. One teacher mentioned:
“The system design never considers that we have to take care of our own children after work, so it is difficult to balance work and family.” (T8)
“Without training or flexible policies, we often have to figure things out on our own.” (T15)

Relational Disconnection
Based on the “Community” dimension of Activity Theory, this topic reveals the experiences of female kindergarten teachers in the teaching relationship network during the implementation of M-Learning. The study found that this dilemma is mainly reflected in the weakening of collaboration between teachers and the tension in home-school relationships, which shows the destruction of the original social support structure by technological intervention.

Weak Peer Collaboration In terms of collaboration, most teachers reported that the shift to individual assignments in M-Learning weakened opportunities for face-to-face experience sharing, hindering the mechanisms for experience sharing and co-construction.
“We used to discuss teaching design together, but now we mostly record our own lessons, so there are far fewer opportunities for communication.” (T6)
In terms of increased parental pressure, teachers universally feel the supervisory pressure brought by enhanced platform transparency, with the previously collaborative home-school relationship evolving into a one-way performance review:
“Parents supervise directly, questioning the arrangement of teaching videos in group chats and demanding explanations for every detail.” (T12)

Reconfigured Division of Labor
This theme originates from the “division of labor” dimension of Activity Theory, the study found that digital teaching not only reconstructs teaching content, but also blurs the basic boundaries of responsibility in educational organizations, placing additional informal labor expectations on female teachers in particular.

In terms of unrecognized task accumulation, several teachers reported that the technology platform relies heavily on individual operation and self-learning, shifting the focus of work that should be carried out by administrators, teaching assistants, or IT staff to individual classroom teachers. One teacher pointed out:

“It's not that I don't want to do the online work, but all the tasks are assumed to be the responsibility of teachers, which makes me feel a lot of pressure.” (T2)
In terms of technological role stereotyping, some teachers pointed out that digital tasks in kindergartens are usually assigned to “young female teachers” by default, assuming that they are more tech-savvy and adaptable:

"I'm not unwilling to learn, but all the technical tasks are assigned to younger teachers, who end up doing the work of three or four people." (T6)
"Just because I'm younger, I'm responsible for the digital aspects of the entire group. Technology has become a burden rather than a professional development opportunity." (T17)

Visual Summary of Themes

To enhance the clarity and overall understanding of the research results, this section presents the five core themes in chart form, namely: Identity Ambiguity, Objective Misalignment, Tool Incompatibility, Policy Constraints, Relational Disconnection, and Reconfigured Division of Labor. Their structure corresponds to the five basic components of Activity Theory: Subject, Object, Tool, Rules, Community, and Division of Labor.Table 1 shows the relationship between Activity Theory, Theme, Sub-theme 1, and Sub-theme 2 for each theme, which helps improve the transparency of the analysis and the reliability of the results.

Table 1
Themes\Sub-Themes of Challenges Faced by Female Kindergarten Teachers in M-learning

Activity Theory	Theme	Sub-theme 1	Sub-theme 2
Subject	Identity Ambiguity	Role Conflict	Weakened Professional Identity
Object	Objective Misalignment	Pedagogical–Technical Gap	Motivational Imbalance
Tools	Tool Incompatibility	Excessive Tech Load	Lack of Age-Appropriate Content
Rules	Policy Constraints	Assessment-Driven Tension	Lack of Gender-Sensitive Support
Community	Relational Disconnection	Weak Peer Collaboration	Increased Parental Pressure
Division of Labor	Reconfigured Division of Labor	Technological Role Stereotyping	Technological Role Stereotyping

Figure 1 shows the interrelationships and positions of each theme in Activity Theory, reflecting the multi-level structural tensions encountered by female kindergarten teachers in the implementation of M-Learning.

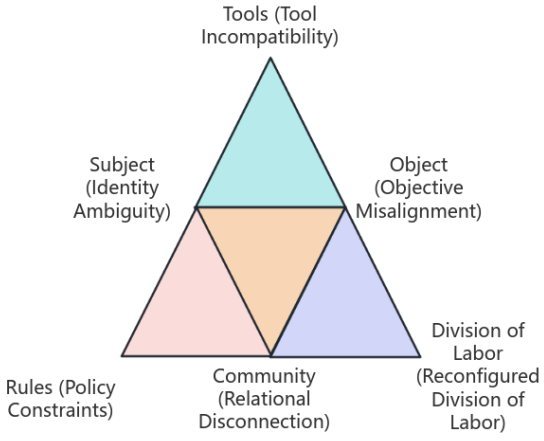

Figure 1 - Activity theory and 6-themes

Discussion

First, “Identity Ambiguity” highlights the profound erosion of the boundaries of the teacher's role due to the integration of technology. Female teachers frequently switch between teaching and family, showing that the technology system fails to match their dual identity (Subject) of social care and professional responsibility. This finding echoes the emotional labor attribute of the teacher's professional role and suggests that future digital education platforms should strengthen the design of support mechanisms for the multiple identity pressures of teachers.

Second, “Objective Misalignment” and “Tool Incompatibility” reflect the disconnect between system design and preschool education concepts (Object, Tool). Technological structures are mostly efficiency- and standard-oriented, neglecting the non-linear characteristics of early childhood development and teachers' emotional involvement, suggesting that policymakers should prioritize the integration of children's developmental stages and teachers' subjectivity in the deployment of digital resources.

“Policy Constraints” and “Relational Disconnection” further indicate that the current assessment system and platform structure, while emphasizing quantifiable performance, weaken the co-construction mechanism between teachers, their peers, and parents (Rules, Community).Teachers are gradually being pushed from the position of educational collaborators to that of technical executors, highlighting the institutional neglect of the characteristics of female labor, which urgently needs to be balanced through gender-sensitive policy interventions.

Finally, “Reconfigured Division of Labor” reveals a hidden task transfer mechanism, whereby young female teachers are assigned additional technical tasks (Division of Labor) due to age and gender stereotypes. This phenomenon reveals the systematic distribution of “informal labor” in educational organizations, which needs to be addressed through institutional role clarification and rational division of labor to reshape organizational fairness.

Conclusions

Using Activity Theory as an analytical framework, this study identifies and analyzes six structural challenges faced by female kindergarten teachers in the implementation of M-Learning: Identity Ambiguity, Objective Misalignment, Tool Incompatibility, Policy Constraints, Relational Disconnection, and Reconfigured Division of Labor.These subjects reveal the multiple dilemmas faced by teachers in terms of career positioning, teaching motivation, technology adaptation, and interpersonal collaboration after the integration of technology into preschool education, particularly highlighting the unique tensions encountered by female teachers due to their gender and age roles. This study emphasizes that the implementation of educational technology cannot be separated from the subjective experiences and structural circumstances of teachers, and that there is an urgent need to introduce gender-sensitive and developmentally appropriate systematic support designs.

However, this study also has certain limitations. First, the data mainly comes from qualitative interviews and lacks cross-validation with quantitative data. Second, the research subjects are mainly female kindergarten teachers, and the differences between teachers of different ages and at different stages of education in the digital transformation process have

not been compared. Future research can further expand the sample scope, combine mixed methods to deepen understanding, and explore more inclusive technical support mechanisms.This study provides a theoretical basis and practical insights for focusing on teacher subjectivity and gender structure in the process of education digitization.

This study contributes to existing research by extending Activity Theory to examine mobile learning implementation in early childhood education from a gendered teacher perspective. By identifying six interrelated structural challenges, the study demonstrates that the adoption of mobile learning is shaped not only by tools and policies, but also by teachers' professional identity, emotional experiences, and gendered roles. This theoretical extension highlights teacher subjectivity as a core component of activity systems in technology-mediated preschool education.

In terms of context, the study provides empirical insights from female kindergarten teachers, a group that remains underrepresented in mobile learning research. The findings reveal how technology integration in preschool settings may generate unintended tensions when developmental and gender-related factors are insufficiently considered. These insights offer practical implications for designing more context-sensitive and sustainable mobile learning support mechanisms in early childhood education.

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