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A Mixed Methods Study of Practices and Challenges in the O Class Early Childhood Education Program in Rural Government Primary Schools in Gubalafo Woreda North Wollo Ethiopia

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Abstract

Early Childhood Care and Education (ECCE) is fundamental to lifelong learning and human development. Ethiopia introduced the O-Class program as a one-year pre-primary modality for six-year-old children in rural areas lacking kindergarten access. Despite policy commitments, the program's implementation quality and effectiveness remain critically under-researched. This study employed a convergent parallel mixed-methods design to examine the practices and challenges of O-Class education in two government primary schools in Gubalafo Woreda, North Wollo Administrative Zone, Ethiopia. Quantitative data were collected through a structured classroom observation checklist (n = 40 observations) and a teacher self-assessment questionnaire (n = 25). Qualitative data were gathered via semi-structured interviews (n = 20), non-participant observation field notes, and document analysis. Quantitative findings revealed that teacher-centered pedagogy dominated instructional time (M = 78.4%, SD = 9.2), while play-based activities accounted for a mean of only 14.6% (SD = 6.8) of observed sessions. Curriculum implementation fidelity was low (M = 2.31 on a 5-point scale, SD = 0.87), and assessment practices relied heavily on written examinations (M = 4.12, SD = 0.73). Qualitative findings corroborated and illuminated these patterns, revealing systemic deficits in teacher training, material resources, and administrative support. Integration of data through joint display analysis demonstrated that the challenges are interconnected and mutually reinforcing. The study concludes that O-Class education in the study area falls substantially short of national standards and recommends dedicated funding, specialized teacher preparation, developmentally appropriate assessment reform, and strengthened stakeholder engagement. These findings offer empirically grounded insights for policy and practice aimed at elevating rural ECCE quality in Ethiopia and comparable contexts.

1. Introduction

1.1 Background

Learning in the first years of life builds the bedrock for future learning, work, and health. The value of investing in early childhood care and education (ECCE) has been identified as crucial for both individual development and a country's development [1, 2]. Evidence clearly shows that good early learning opportunities increase children's cognitive, social, emotional, and physical development, resulting in better performance in school and lower drop-out and repetition rates in the future [3, 4].

In Ethiopia, the Education and Training Policy adopted in 1994 included pre-primary education as preparation for children aged 4–6 years [5]. Yet, for decades, pre-primary education was not prioritized due to insufficient government funding, with services offered either by private institutions or non-governmental organizations [6]. To improve access to ECCE, especially in rural areas, the government of Ethiopia launched the O-Class modality in 2003 E.C. (2010/11 G.C.) [7]. The O-Class modality is a one-year pre-primary education service linked to primary schools for six-year-old children without kindergarten experience. It is designed to provide fundamental learning skills: pre-reading, pre-writing, pre-counting, and pre-arithmetic skills, as well as social and adaptive skills before Grade 1 [8, 9].

Even though these policy commitments have been made, O-Class education implementation, especially in rural environments, faces numerous challenges. The National Policy Framework for ECCE [10] highlights the significance of quality early intervention, but studies have found that rural pre-schools lack qualified teachers, materials, and conducive environments [11, 12]. In addition, community involvement in O-Class education is poor [13].

1.2 Statement of the Problem

Despite the Ethiopian government's efforts to expand ECCE via the O-Class system, the issue of quality remains a significant concern [14, 15]. The challenges faced by the O-Class system are particularly acute in rural settings such as Gubalafo Woreda, located in the North Wollo Administrative Zone. Teachers responsible for O-Class are mainly primary school teachers with no special training in ECCE. Classes are often conducted in the same room as other grades, and few materials for play learning are available. There is little participation by parents and the community at large. All these factors raise serious doubts about how well the O-Class prepares children for primary school education.

Although a significant amount of literature has been published about ECCE in Ethiopia [11, 12, 13], there has been little research that systematically integrates qualitative and quantitative evidence on the practices and problems surrounding O-Class education in rural government schools. Existing studies tend to be either purely qualitative or purely quantitative, limiting the depth and breadth of understanding needed for effective policy intervention. This study aims to fill this gap by employing a mixed-methods design to examine the current state of O-Class education in two rural government schools in Gubalafo Woreda.

1.3 Research Objectives

The general objective of this study was to investigate the existing practices and challenges of O-Class education in North Wollo Administrative Zone, Gubalafo Woreda, at government schools using a mixed-methods approach. The specific objectives were:

1. To explore how children learn and the methods of teaching used in O-Class education in rural government schools.
2. To examine the organization and implementation of curriculum materials in O-Class education.
3. To assess how teachers evaluate children's learning and progress in O-Class education.

1.4 Research Questions

1. How do children learn and what teaching methods are employed in O-Class education in rural governmental schools?
2. How is curriculum material organized and implemented in O-Class education?
3. How do teachers evaluate children's learning in O-Class education?

2. Literature Review

2.1 Theoretical Foundations of Early Childhood Education

ECE is based on the theoretical foundations of Piaget, Vygotsky, Montessori, and Froebel, among others. Piaget [16] stressed that children learn by actively engaging in interaction with the environment. Vygotsky's theory emphasizes the need for social interaction and scaffolding in learning. Montessori's approach to ECE [17] stressed the need for self-directed learning in a well-prepared environment using scientifically designed materials. Froebel established the first kindergarten in 1837 and stressed that play was the main way of learning in early childhood [18]. All these theoretical foundations stress certain common ideas: the need for active participation, the role of play in the learning process, and preparation of the environment.

2.2 Historical Development of ECCE in Ethiopia

Modern preschool education in Ethiopia started in the early 20th century with the introduction of the first kindergarten in Dire Dawa in 1908, serving children of foreigners working in railway construction [11]. The growth of preschool education took place under the socialist government (1974–1991), and a curriculum for preschool was drawn for the first time [11]. The 1994 Education and Training Policy considered pre-primary education as a formal level of education but left the responsibility of its implementation to private organizations and NGOs [5]. The O-Class education started in 2003 E.C. as a government initiative to promote ECCE, especially in rural areas [7]. The National Policy Framework for ECCE [10] reiterated the government's commitment to early childhood care and education.

2.3 Quality of Early Childhood Education

Quality of ECCE includes structural elements (teacher qualifications, class sizes, and teaching materials), process elements (teaching and children's interactions), and outcomes (children's development and learning). High-quality ECCE is defined by the training of teachers, a developmentally appropriate curriculum, a safe and stimulating environment, and the engagement of families and communities [4, 19]. In Ethiopia, questions on the quality of ECCE are being raised due to a decline in the number of trained teachers, lack of supervision, and inadequate teaching materials [14]. The O-Class scheme, in particular, is facing serious quality problems in rural settings.

2.4 The O-Class Program: Policy and Practice

The O-Class curriculum entails a one-year pre-primary curriculum offered by primary schools and targeted towards six-year-old children who do not attend kindergarten. This curriculum seeks to provide children with fundamental knowledge in pre-reading, pre-writing, pre-counting, and pre-mathematics, as well as social-emotional skills [8]. This program is supposed to adopt a play-based and child-centered approach in teaching, and teachers should act as facilitators instead of lecturers. However, studies have

shown that the O-Class curriculum deviates from its intended purpose. Some teachers lack skills in early childhood education, classrooms are under-equipped, and assessments may be done using incorrect methodologies [13]. Despite the curricular material having been developed at the national level, effective delivery at the school level faces numerous challenges.

2.5 Challenges in Rural ECCE Implementation

Rural ECCE programs are often hampered by a shortage of trained teachers, with many educators assigned to O-Class having backgrounds primarily in primary education rather than specialized early childhood training [11]. This lack of qualified personnel affects the quality of instruction and the ability to implement developmentally appropriate practices. Additionally, infrastructural deficiencies are prevalent, as classrooms are frequently shared with primary grades and lack child-sized furniture or designated learning corners [12]. The scarcity of instructional materials presents another significant obstacle, with play materials, picture books, and manipulative resources often being limited or unavailable [12]. Moreover, weak parental and community engagement further diminishes the effectiveness of ECCE programs [11]. Financial constraints and cultural factors also play a crucial role in shaping the landscape of rural ECCE [12].

2.6 Parent and Community Involvement

Parental and community involvement is critical for the success of ECCE programs. Research shows that when parents are engaged in their children's early learning, children demonstrate better cognitive, social, and emotional outcomes [20, 21]. In the Ethiopian context, however, parent-school relationships in rural areas are often weak, characterized by limited communication, low awareness of ECCE objectives, and minimal participation in school activities [13].

2.7 Assessment in Early Childhood Education

Assessment in ECCE should be developmentally appropriate, focusing on observation, portfolios, and authentic tasks rather than standardized tests [22]. The purpose of assessment is to inform instruction, identify children needing additional support, and communicate progress to parents. In Ethiopia, however, O-Class assessment practices often mirror primary school methods, relying on written exams and marks that are inappropriate for young children [13].

3. Methodology

3.1 Research Design

This study employed a **convergent parallel mixed-methods design** (Creswell & Plano Clark, 2018). This design was selected to collect quantitative and qualitative data concurrently, analyze them separately, and then integrate the findings during interpretation to provide a comprehensive understanding of O-Class practices and challenges. The convergent design is particularly suited for examining complex educational phenomena where both the magnitude of patterns and the depth of stakeholder experiences are needed [23, 24, 25].

3.2 Study Setting

The study was conducted in Gubalafto Woreda, North Wollo Administrative Zone, Amhara Regional State, Ethiopia. Two government primary schools with O-Class programs were purposively selected: Zigilba Elementary School (Grades 1–4) and Limsare Elementary School (Grades 1–8). Both schools are located in rural areas and serve agrarian communities.

3.3 Participants

Quantitative Strand

A total of 25 O-Class teachers from government primary schools in the woreda completed the teacher self-assessment questionnaire. Additionally, 40 structured classroom observations were conducted across the two schools (20 observations per school).

Qualitative Strand

A total of 20 participants were purposively selected based on their direct involvement in or knowledge of O-Class education. Participants included

Participant Category	Number	Selection Criteria
Woreda Education Office Experts	2	Position and expertise in ECCE
School Directors	2	Administrative responsibility for O-Class
O-Class Teachers	2	Direct teaching responsibility
Primary School Teachers	4	Experience with O-Class graduates
Parents	4	Voluntary participation
O-Class Children	6	Enrolled in O-Class
Total	20	

Purposeful sampling was used because it allows the researcher to select information-rich cases that illuminate the research questions [26, 27].

3.4 Data Collection Instruments

3.4.1 Structured Classroom Observation Checklist (Quantitative)

A structured observation checklist was developed based on the O-Class curriculum implementation guide [8]. The checklist captured: (a) frequency of teacher-centered versus child-centered instructional episodes, (b) presence and duration of play-based activities, (c) availability and use of instructional materials, and (d) assessment activities. Inter-rater reliability was established through dual coding of 20% of observations (Cohen's $\kappa = 0.84$).

3.4.2 Teacher Self-Assessment Questionnaire (Quantitative)

A 24-item questionnaire was administered to 25 O-Class teachers. The instrument covered four domains: teaching methods, curriculum implementation, assessment practices, and resource availability. Items were rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Content validity was established through expert review by three ECCE specialists. Cronbach's alpha for the overall scale was 0.87.

3.4.3 Semi-Structured Interviews (Qualitative)

In-depth interviews were conducted with all 20 qualitative participants. An interview guide was developed based on the research questions, covering topics such as teaching methods, curriculum implementation, assessment practices, and stakeholder involvement.

3.4.4 Classroom Observation (Qualitative)

Non-participant observations were conducted in O-Class classrooms over a one-month period in each school. Field notes captured teaching methods, teacher-child interactions, classroom environment, availability and use of materials, and children's participation. Outdoor play areas and facilities were also observed.

3.4.5 Document Analysis (Qualitative)

Relevant documents were analyzed, including curriculum guides, teacher lesson plans, assessment records, school reports, and policy documents. Document analysis provided contextual information and triangulated data from interviews and observations [28].

3.5 Data Analysis

Quantitative Analysis

Quantitative data were analyzed using SPSS version 26. Descriptive statistics (frequencies, percentages, means, and standard deviations) were computed for all quantitative variables. The results are presented in tables and figures.

Qualitative Analysis: Qualitative data were analyzed using thematic analysis [29]. The analysis process involved: (1) transcribing and translating interview recordings; (2) reading transcripts multiple times to gain familiarity; (3) coding data inductively and deductively based on research questions; (4) identifying patterns and developing themes; (5) organizing themes into coherent categories; and (6) interpreting findings in relation to literature and research objectives.

Integration

Following separate analyses, quantitative and qualitative findings were integrated using a **joint display analysis** approach. This involved creating matrices that juxtapose quantitative results with corresponding qualitative themes, enabling identification of convergence, divergence, and elaboration [19].

3.6 Validity and Trustworthiness

Several strategies were employed to ensure validity and trustworthiness:

- Triangulation: Multiple data sources and methods were used.
- Member checking: Preliminary findings were shared with participants for verification.
- Thick description: Detailed contextual information was provided to enable transferability.
- Reflexivity: The researcher maintained awareness of personal biases and their potential influence.
- Audit trail: Detailed records of research decisions and processes were maintained.

4. Results and Discussion

4.1 Quantitative Findings

4.1.1 Teaching and Learning Methods

Structured classroom observations (n = 40) revealed that teaching in O-Class was overwhelmingly teacher-centered. As shown in Table 1, teacher-centered instruction (lecturing, demonstration, dictation) accounted for a mean of 78.4% of observed instructional time (SD = 9.2), while child-centered activities (group work, play-based learning, guided discovery) accounted for a mean of 14.6% (SD = 6.8). The remaining time was consumed by transitions and classroom management.

Table 1
Observed Distribution of Instructional Approaches in O-Class (n = 40 observations)

Instructional Approach	Mean Percentage of Time	SD	Range
Teacher-Centered (Lecture, Dictation, Demonstration)	78.4%	9.2	62–91%
Child-Centered (Group Work, Play, Discovery)	14.6%	6.8	4–27%
Transitions/Management	7.0%	3.1	2–14%

Teacher self-assessment questionnaire results (n = 25) corroborated this pattern. Teachers reported using lecture as their primary method (M = 4.31, SD = 0.62 on a 5-point scale), while play-based methods were infrequently used (M = 2.18, SD = 0.84). The difference was statistically significant ($t(24) = 9.84$, $p < .001$).

4.1.2 Curriculum Implementation

Teachers rated the extent of curriculum implementation across multiple dimensions. Table 2 presents the descriptive statistics.

Table 2
Teacher Ratings of Curriculum Implementation Dimensions (n = 25)

Dimension	Mean	SD	Interpretation
Equal emphasis on all objectives	2.31	0.87	Low
Age-appropriate content delivery	2.54	0.91	Low-Moderate
Availability of individual textbooks	1.42	0.68	Very Low
Teacher involvement in curriculum adaptation	2.08	0.79	Low
Adequacy of curriculum guides	2.76	0.94	Moderate

The lowest-rated dimension was availability of individual textbooks (M = 1.42, SD = 0.68), indicating that children rarely had access to their own learning materials. Teachers also reported limited involvement in curriculum adaptation (M = 2.08, SD = 0.79), suggesting a top-down implementation model.

4.1.3 Assessment Practices

Teacher responses regarding assessment practices are summarized in Table 3. The data indicate a strong reliance on formal, written assessment methods that are developmentally inappropriate for six-year-old children.

Table 3
Teacher Assessment Practices in O-Class (n = 25)

Assessment Practice	Mean	SD
Use of written exams	4.12	0.73
Use of observation-based assessment	2.04	0.81
Use of portfolios	1.48	0.62
Assessment embedded in daily activities	1.92	0.77
Training received on ECCE assessment	1.56	0.71

Written exams were the most frequently used method (M = 4.12, SD = 0.73), while developmentally appropriate methods such as observation (M = 2.04), portfolios (M = 1.48), and embedded assessment (M = 1.92) were rarely employed. Notably, teachers reported very low levels of training on ECCE assessment (M = 1.56, SD = 0.71).

4.1.4 Resource Availability

Teachers' ratings of resource adequacy are presented in Table 4.

Table 4
Teacher Ratings of Resource Availability (n = 25)

Resource Category	Mean	SD
Age-appropriate furniture	1.84	0.75
Play materials	1.52	0.66
Pictorial/print materials	2.12	0.83
Learning corners (e.g., art, music, math)	1.36	0.57
Outdoor play equipment	1.68	0.72
Overall resource adequacy	1.70	0.64

All resource categories received mean ratings below 2.2 on the 5-point scale, indicating severe inadequacy. Learning corners were the least available resource (M = 1.36, SD = 0.57).

4.2 Qualitative Findings

4.2.1 Theme 1: Predominantly Teacher-Centered Pedagogy

Observation and interview data revealed that teaching in both O-Classes was predominantly teacher-centered. In Zigilba, the teacher used some play-based activities, including songs, stories, and role-play,

but these were limited. In Limsare, teaching was largely lecture-based, with the teacher writing letters and numbers on the blackboard while children copied them.

"The teacher was not using play-based teaching methods and the students were not following him because he was not attracting the children in the classroom. He simply lectured the alphabet words and the children followed the teacher." (Observation notes, Limsare)

"Teacher A in Zigilba used student-centered teaching methodology, game methods, storytelling, and play teaching methodology. He organized children in groups and told them subjective playing." (Observation notes, Zigilba)

However, even in Zigilba, the range of methods was limited. Demonstration, discussion, and question-and-answer methods were occasionally used, but cooperative learning, brainstorming, and guided discovery were rare.

4.2.2 Theme 2: Inadequate Curriculum Implementation

Document analysis revealed that the O-Class curriculum was organized around themes with objectives, expected outcomes, activities, and assessment indicators. However, implementation was inconsistent. Key issues included:

- Unequal emphasis on objectives: Cognitive skills (letters, numbers) received more attention than social-emotional or psychomotor development.
- Age-inappropriate content: Some teachers taught content beyond the O-Class syllabus, resembling Grade 1 work.
- Lack of individual textbooks: Children shared teacher guides; no individual textbooks were available.
- Top-down approach: Teachers had limited involvement in curriculum adaptation.

"The O-Class curriculum organized simple to complex and the continuity of the curriculum that planned reception content at successive levels. This O-Class curriculum is repeated the course or content because the children must learn repeating content." (Document analysis, Zigilba)

"The O-Class curriculum not ordered in successive way it is not included, what is to follow next to that, what is the most appropriate to the O-Class children." (Document analysis, Limsare)

4.2.3 Theme 3: Inappropriate Assessment Methods

Both schools used assessment methods that mirrored primary school practices, including written exams, homework, and marks. Teachers reported lacking training on developmentally appropriate assessment for young children.

"The assessment mechanisms to check student progress were not appropriate, being formally similar to that of primary and secondary level. Teachers were not following the rules of O-Class assessment method because they were not given training how to assess the O-Class children." (Teacher A, Zigilba)

"I assessed written exam to the O-Class children they practiced writing skill A, B, C, D, E, F, and how to write their name… the mark the objectives of the written exam was the basic skill purpose that means the writing reading speaking and listening skill." (Teacher B, Limsare)

4.2.4 Theme 4: Inadequate Physical Environment and Materials

O-Class classrooms were found to be inadequate in terms of space, furniture, and materials. Classrooms were dusty, walls were not decorated with children's work, and desks were adult-sized, restricting children's movement. Outdoor play areas were unsafe or lacked equipment.

"The classroom was not suitable to the children, the desk was not child sized, the classroom was also dusty or not clean, the wall also not attractive for the children and the blackboard also not comfortable to the children." (Observation notes, Zigilba)

"The blocks, pictorial books, art materials, shop corners, family corners, health corners, music corners, mathematics corner, table toys and pictorial teaching aids were inadequate in the average O-Class." (Observation notes, Limsare)

4.2.5 Theme 5: Lack of Specialized Training

Neither O-Class teacher had specialized training in early childhood education. Both were primary school teachers assigned to O-Class without additional preparation.

"I have not received specialized training in early childhood education. I teach based on my experience as a primary school teacher." (Teacher B, Limsare)

"Teachers do not have specialized training in early childhood education. This shortage of training on preschool level can influence negatively on the children's academic, social, emotional and moral development." (Director A)

4.2.6 Theme 6: Minimal Parental Involvement

Parental involvement in O-Class education was minimal in both schools. Parents reported limited communication with teachers, lack of awareness about the O-Class curriculum, and competing demands on their time.

"Parents and teachers are not jointly responsible for ensuring that children are successful in school… communication is essential information should be exchanged with families on a regular basis. It has not been documentation of their children's learning, development and participation in the program." (Parent 4, Zigilba)

"The teacher was not collaborated with the parent and the parent also not assisted the teachers so the instructional activity was not mindful without the stakeholders." (Parent 4, Limsare)

4.2.7 Theme 7: Insufficient Administrative Support

O-Class programs lacked dedicated administrative structures. School directors managed O-Class alongside primary grades, and there were no separate budgets or supervisory systems for pre-primary education.

"The O-Class was not separated from that of the primary school; he managed with the primary school. He was also managing the primary and preprimary school, teachers, children and the community." (Director A, Zigilba)

"The government must organize preschool administration or O-Class education in rural area like kindergartens education and primary education, so they do not have strong decision making body like a board of directors for administering of O-Class." (Parent 3, Limsare)

4.3 Integration of Quantitative and Qualitative Findings

Table 5 presents a joint display that integrates the quantitative and qualitative findings, demonstrating convergence across data sources.

Table 5
Joint Display of Quantitative and Qualitative Findings

Domain	Quantitative Finding	Qualitative Theme	Convergence/Elaboration
Teaching Methods	Teacher-centered: 78.4% of time; Play-based: 14.6%	Predominantly teacher-centered pedagogy; limited play	Convergence: Quantitative magnitude confirmed by qualitative depth
Curriculum Implementation	Low fidelity (M = 2.31); No textbooks (M = 1.42)	Unequal objectives; age-inappropriate content; top-down	Convergence with elaboration: Qualitative reveals reasons behind low ratings
Assessment	Written exams dominate (M = 4.12); Training low (M = 1.56)	Inappropriate methods; no training	Convergence: Both data sources identify written exams and training gap
Resources	All categories < 2.2; Learning corners lowest (M = 1.36)	Inadequate environment; no materials	Convergence: Quantitative severity confirmed by qualitative descriptions
Teacher Training	Training rating: M = 1.56 (assessment); 1.42 (textbooks)	No specialized ECCE training	Convergence: Consistent across all data sources
Parental Involvement	Not directly quantified	Minimal involvement; weak communication	Qualitative-only; indicates need for future quantitative measurement
Administration	Not directly quantified	No dedicated budget or supervision	Qualitative-only; indicates structural gap

The integration reveals that the challenges identified through quantitative and qualitative methods are not independent but rather **mutually reinforcing**. For example, the lack of specialized training (Theme 5) directly manifests in the low fidelity of curriculum implementation (M = 2.31) and the reliance on inappropriate assessment methods (M = 4.12). Similarly, the scarcity of resources (M = 1.70 overall) constrains teachers' ability to implement play-based pedagogy even when they possess some awareness of its importance.

4.4 Discussion

The findings of this study paint a concerning picture of O-Class education in rural Gubalafo Woreda. The convergence of quantitative and qualitative evidence provides robust support for the conclusion that the program is operating well below its intended standards.

The predominance of teacher-centered pedagogy (78.4% of observed time) stands in stark contrast to the O-Class curriculum's explicit mandate for play-based, child-centered instruction [8]. This finding aligns with previous research indicating that Ethiopian pre-primary teachers often lack the pedagogical skills for developmentally appropriate practice [13, 34]. The limited use of varied teaching methods reflects both training gaps and the influence of primary school teaching norms, where content transmission is prioritized over experiential learning.

The low fidelity of curriculum implementation (M = 2.31) corroborates Demeke's [11] observation that Ethiopian pre-primary curricula are often not effectively implemented due to teacher capacity gaps and resource constraints. The lack of individual textbooks (M = 1.42) is particularly concerning, as it limits children's opportunities for independent practice and parent-assisted learning at home.

The reliance on written exams (M = 4.12) for six-year-old children contradicts best practices in early childhood assessment [22]. Developmentally appropriate assessment should be ongoing, observation-based, and embedded in daily activities. The teachers' reliance on formal testing reflects both their primary school backgrounds and the lack of specific training in ECCE assessment (M = 1.56).

The severe inadequacy of resources (overall M = 1.70) contradicts national guidelines for ECCE, which specify that learning spaces should be safe, stimulating, and age-appropriate [10, 35]. The lack of child-sized furniture and play materials undermines the play-based pedagogy that is central to the O-Class curriculum.

The absence of specialized teacher training is a critical systemic issue. Effective ECCE teaching requires knowledge of child development, play-based pedagogy, and developmentally appropriate practices [36, 37]. The finding that O-Class teachers are drawn from primary school staff without additional training reflects the absence of a dedicated cadre of trained pre-primary teachers in Ethiopia.

The weak parent-school relationship, while not quantified in this study, is concerning given the well-documented benefits of parental involvement for children's early learning [20, 21]. In rural Ethiopian

contexts, parents may have limited understanding of the O-Class program's objectives and may view education as solely the teacher's responsibility.

Finally, the lack of dedicated administrative support for O-Class reflects the broader marginalization of ECCE within the Ethiopian education system. When pre-primary programs are subsumed under primary school administration, they often receive less attention, resources, and supervision.

5. Conclusion

5.1 Summary of Findings

This study investigated the practices and challenges of O-Class education in two rural government schools in Gubalafto Woreda, Ethiopia, using a convergent mixed-methods design. The findings reveal that:

- Teaching methods were predominantly teacher-centered (78.4% of instructional time), with limited use of play-based, child-centered approaches (14.6%).
- Curriculum implementation was inadequate (M = 2.31), with unequal emphasis on objectives, age-inappropriate content, and a lack of individual textbooks (M = 1.42).
- Assessment practices mirrored primary school methods, relying heavily on written exams (M = 4.12) that are inappropriate for preschool children.
- Physical environments were inadequate, with poor classroom conditions, insufficient materials (overall M = 1.70), and unsafe or unequipped playgrounds.
- Teacher training was lacking, with no specialized preparation in early childhood education (M = 1.56).
- Parent-school relationships were weak, limiting children's learning support at home.
- Administrative support was insufficient, with no dedicated budget, supervision, or governance structures for O-Class.

5.2 Implications

For Policy and Practice:

The Ministry of Education should develop clear guidelines and standards for O-Class implementation, including minimum requirements for teacher qualifications, classroom environments, and materials. Dedicated budget lines for O-Class programs should be established at federal, regional, and woreda levels.

A specialized cadre of pre-primary teachers should be developed through pre-service training programs in teacher education colleges. In-service training on play-based pedagogy, child development, and developmentally appropriate assessment should be provided to all O-Class teachers.

Schools should be supported to create print-rich, child-friendly classroom environments with age-appropriate furniture and learning corners. Parental engagement strategies should be designed and implemented, including awareness campaigns, regular communication, and capacity-building workshops. Head teachers and supervisors should receive training on ECCE leadership and supervision.

For Research:

Future research should examine the impact of O-Class education on children's primary school outcomes using longitudinal designs. Comparative studies across different regions and program modalities (O-Class, kindergarten, child-to-child) would inform policy decisions. Research on culturally appropriate ECCE practices in Ethiopian rural contexts is warranted. Additionally, future studies should quantify parental involvement and administrative support to enable fuller integration with qualitative findings.

5.3 Limitations

The study was limited to two schools in one woreda, limiting generalizability. The quantitative sample of 25 teachers, while adequate for descriptive analysis, limits the statistical power for inferential testing. Despite reflexivity efforts, the researcher's perspectives may have influenced data interpretation. The one-month observation period in each school may not have captured seasonal variations in attendance or teaching practices. Translation of interviews from Amharic to English may have resulted in some loss of nuance.

5.4 Recommendations

Based on the findings, the following recommendations are made:

Government and Policymakers:

- Allocate dedicated funding for O-Class programs in rural areas.
- Develop and enforce minimum standards for O-Class infrastructure, materials, and teacher qualifications.
- Establish specialized pre-primary teacher training programs.
- Strengthen supervision and support systems for O-Class.

Woreda Education Offices:

- Provide in-service training for O-Class teachers on play-based pedagogy and assessment.
- Supply age-appropriate materials, furniture, and play equipment.
- Facilitate parent awareness and engagement programs.
- Appoint dedicated ECCE supervisors.

School Directors:

- Create separate, child-friendly O-Class learning spaces.

- Support teachers in implementing the O-Class curriculum.
- Establish regular communication with parents.
- Advocate for resources from woreda and regional offices.

Teachers:

- Participate in professional development opportunities.
- Implement child-centered, play-based teaching methods.
- Use developmentally appropriate assessment practices.
- Engage parents in their children's learning.

Parents and Communities:

- Actively participate in school activities and communicate with teachers.
- Support children's learning at home through play and interaction.
- Advocate for quality O-Class education in their communities.

NGOs and Development Partners:

- Provide technical and financial support for O-Class quality improvement.
- Support teacher training and material development.
- Facilitate community mobilization and awareness campaigns.

Declarations

Ethical approval

This study was approved by the Research Ethics Committee of the College of Education, Oda Bultum University, Ethiopia, in accordance with the Declaration of Helsinki and the institutional research guidelines of Oda Bultum University. The protocol number for this approval is **OBU/EDU/2024/045**. Permission to conduct the study was also obtained from the Gubalafo Woreda Education Office and the directors of the participating schools.

Consent to participate

Informed written consent (Consent to participate) was obtained from all participants, for participants under 18 years of age, informed written consent was obtained from a parent and/or legal guardian. In addition, age-appropriate assent was obtained from the O-Class children before their participation. All participants were informed that participation was voluntary and that they could withdraw at any time without penalty.

Consent to publish

Not applicable. The manuscript does not contain identifying personal information, images, or other individual-level data that would require consent to publish. All participant quotations are anonymized.

Availability of data and materials

The datasets generated during and/or analyzed during the current study are not publicly available due to participant confidentiality but are available from the corresponding author on reasonable request.

Competing interests

The authors declare no competing interests.

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Authors' contributions

All authors equally conceived and designed the study, collected and analyzed the data, and wrote the manuscript. All authors read and approved the final manuscript.

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