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From Framework to Classroom: Field Application and Preliminary Evaluation of a Structured Bilingual Observation Checklist for Preoperational Behaviours in Early Childhood

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Abstract: ***Early childhood classrooms provide important opportunities for observing children's emerging cognitive, social, and emotional competencies through naturally occurring activities and interactions. However, teachers may require structured observation frameworks that enable them to document developmental behaviours systematically without converting classroom observation into formal diagnostic assessment. Building on a previously published bilingual observational framework, the present study examined its field application through structured classroom observations of young children in early childhood settings. The observational framework comprised 16 indicators across four domains relevant to preoperational development: centration, conservation, symbolic play, and social-emotional learning (SEL). Observations were recorded using a three-level rating framework-Not Yet, Emerging, and Consistent-across a dataset of 41 observations. Descriptive analysis was conducted at the item and domain levels, together with examination of relationships among domains and internal consistency. The findings indicated comparatively stronger observed performance in symbolic play and SEL, while conservation and centration showed relatively lower domain scores. The overall 16-item checklist demonstrated moderate internal consistency (Cronbach's α = .672), while the subscale coefficients were comparatively low. The findings suggest that structured bilingual observation can provide teachers with systematic information about children's classroom behaviours and may support more responsive instructional planning. However, the preliminary reliability findings indicate that the checklist should be regarded as an observational framework rather than a fully validated psychometric instrument. The study highlights the value of extending theoretically grounded observational tools into authentic classroom contexts and provides preliminary empirical evidence for their practical use in teacher education and early childhood settings.***

Keywords: early childhood education, bilingual observation, preoperational development, classroom observation, teacher education, symbolic play, social-emotional learning, developmental observation

1. Introduction

Early childhood is a period of rapid cognitive, social, emotional, and linguistic development. Children's classroom behaviours provide teachers with opportunities to observe how developmental processes are expressed through play, interaction, communication, problem-solving, and everyday learning experiences. Systematic observation can therefore serve as an important bridge between developmental theory and classroom practice. Rather than viewing developmental characteristics only through formal assessment, teachers can use naturally occurring classroom situations to identify patterns in children's thinking and behaviour and adapt instructional experiences accordingly (Bredekamp & Copple, 1997; Wortham, 2012).

Piaget's theory of cognitive development provides an important foundation for understanding children's thinking during the preoperational period. Children in this period increasingly use symbolic representation, language, and pretend play, while their reasoning may continue to be influenced by centration and difficulties with conservation and reversibility (Piaget, 1952, 1962). These characteristics are particularly relevant to classroom observation because they may become visible during ordinary activities involving comparison, classification, representation, play, and interaction (Piaget, 1952; Asokan et al., 2014).

At the same time, children's development cannot be understood independently of social and cultural contexts. Vygotsky's sociocultural perspective emphasises the role of social interaction, language, and scaffolding in learning and development (Vygotsky, 1978). From this perspective, teacher observation is not merely a process of identifying what a child can or cannot do; it can also help teachers understand how children respond to support and how instructional interactions can extend learning through guided participation and scaffolding (Vygotsky, 1978).

The multilingual nature of many Indian early childhood classrooms adds another important dimension to classroom observation, particularly in relation to equitable participation and interpretation of children's classroom communication. Children may communicate and demonstrate understanding through more than one language, and teachers may need observation approaches that are sensitive to linguistic diversity rather than treating language differences as developmental deficits. A bilingual observation framework can therefore provide a practical means of supporting teachers while acknowledging the linguistic realities of classroom settings (Wortham, 2012).

An earlier publication by the researcher presented a bilingual observation checklist intended to support the identification of preoperational cognitive skills in early childhood classrooms (Maruthi, 2026). The present study extends that work by moving from the presentation of the observational framework to its systematic field application and empirical examination. Thus, the purpose of the present study was not to introduce another observational tool, but to examine what the previously developed framework revealed when used in actual classroom observations.

The present study focused on four domains: centration, conservation, symbolic play, and social-emotional learning. These domains were selected to provide a structured view of children's developmental behaviours while retaining the practical orientation of classroom observation.

1.1 Purpose of the Study

The purpose of the study was to examine the field application of a structured bilingual observation checklist for documenting preoperational behaviours in early childhood classroom settings.

1.2 Objectives

The study aimed to:

1) Examine children's observed behaviours across the four domains of centration, conservation, symbolic play, and social-emotional learning;
2) Examine item-level and domain-level patterns in the observational data;
3) Examine relationships among the four observed domains; and
4) Examine the internal consistency of the 16-item observational checklist.

2. Methodology

2.1 Research Design

The study employed a structured observational approach in authentic early childhood classroom settings. The observation framework was used to document naturally occurring behaviours relevant to the four selected developmental domains. The emphasis was on systematic classroom observation rather than diagnostic or evaluative assessment, consistent with developmentally appropriate observation and assessment practice (Bredekamp & Copple, 1997; Wortham, 2012).

2.2 Observation Framework

The observational checklist comprised 16 indicators distributed equally across four domains, consistent with the framework developed and presented in the earlier publication (Maruthi, 2026):

- Centration
- Conservation
- Symbolic Play
- Social-Emotional Learning (SEL)

Each domain contained four observational indicators. Behaviours were recorded using a three-level observational rating framework:

- Not Yet (N)
- Emerging (E)
- Consistent (C)

The framework was designed to support teachers in documenting observable behaviours in classroom contexts rather than assigning diagnostic labels to children.

2.3 Data Collection

The checklist was used consistently for classroom observation and data collection. The final dataset comprised 41 observations. Observations were recorded across the four domains using the structured indicators and rating framework.

The bilingual nature of the framework was intended to support classroom observation in multilingual contexts, particularly where Kannada and English were relevant to teacher–child interaction and classroom communication (Wortham, 2012).

2.4 Data Analysis

The observational data were analysed at item and domain levels. Descriptive statistics were used to examine the distribution of scores across the 16 indicators and four domains. Inter-domain relationships were examined through correlation analysis. Internal consistency of the overall checklist and its domain-level groupings was examined using Cronbach's alpha.

Because the instrument was designed as an observational framework for classroom use, the statistical findings were interpreted as preliminary evidence regarding the functioning of the checklist rather than as evidence of diagnostic validity.

3. Results

3.1 Item-Level Findings

The item means ranged from 1.537 to 2.732. The highest item mean was observed for Symbolic Play item 3 (SP3; M = 2.732), while the lowest was observed for Centration item 1 (CS1; M = 1.537). Item-level standard deviations ranged from 0.449 to 0.813, indicating variation in the observed frequency and consistency of behaviours across individual indicators.

3.2 Domain-Level Findings

The domain-level findings demonstrated differences in the observed patterns across the four developmental domains.

Symbolic Play recorded the highest domain score, followed by Social-Emotional Learning. Centration and Conservation recorded comparatively lower scores.

These findings suggest that behaviours associated with symbolic representation and social-emotional functioning were more consistently observed within the participating classroom observations than behaviours associated with centration and conservation.

3.3 Inter-Domain Relationships

The inter-domain correlation analysis examined the relationships among Centration, Conservation, Symbolic Play, and Social-Emotional Learning. The pattern of relationships provided an indication of the extent to which the four domains were associated within the observed classroom behaviours.

Because the four domains represent related but conceptually distinct developmental behaviours, the correlation findings were interpreted as evidence of relationships among observed domains rather than as evidence that the domains constitute a single homogeneous construct.

3.4 Internal Consistency

The overall 16-item checklist demonstrated moderate internal consistency (Cronbach's α = .672).
However, the internal consistency coefficients for the individual domains were comparatively low:
Centration: **α = .149**
Conservation: **α = .221**
Symbolic Play: **α = .207**

These findings indicate that the checklist should not presently be interpreted as a fully established psychometric scale. Instead, the findings support its use as a structured observational framework whose individual indicators capture different classroom manifestations of developmental behaviours.

4. Discussion

The present study extended an earlier bilingual observational framework by examining its application in authentic early childhood classroom observations. The findings demonstrate the value of moving beyond the conceptual development of an observation tool to examine how its indicators function when used systematically in practice. The structured format enabled teachers to document developmental behaviours across four domains while retaining the framework's classroom-based and non-diagnostic orientation.

The relatively higher scores observed in Symbolic Play are consistent with the developmental significance of symbolic representation during the preoperational period. Pretend play, representational activity, and the use of objects or actions to stand for other things are important expressions of children's emerging symbolic thought (Piaget, 1962). The relatively high Symbolic Play score therefore suggests that these behaviours may be particularly accessible to teachers through ordinary classroom observation and play-based experiences.

Social-Emotional Learning also demonstrated a relatively high domain score. This finding reinforces the importance of viewing early childhood development as multidimensional. Children's classroom functioning includes not only cognitive characteristics but also social participation, emotional expression, interaction, and responses to others. Developmentally appropriate practice encourages teachers to attend to the whole child and to use knowledge of children's individual characteristics when planning learning experiences (Bredekamp & Copple, 1997).

The comparatively lower scores for Centration and Conservation are also noteworthy. These areas are closely associated with characteristic limitations of preoperational reasoning (Piaget, 1952). Difficulties related to attending to multiple dimensions of a situation and understanding conservation may not always be equally visible during routine classroom activities. Their relatively lower scores may therefore indicate areas where more intentional observation opportunities or carefully designed classroom experiences could be useful.

The overall internal consistency coefficient of .672 provides preliminary evidence that the 16 indicators demonstrate a moderate degree of overall coherence. However, the low subscale coefficients indicate that the four-item domains should not be treated as psychometrically established scales. Developmental behaviours within a domain may manifest in diverse ways across classroom contexts, and four indicators per domain provide limited opportunity to capture the breadth of each construct. These findings reinforce the need to interpret the framework primarily as a classroom observation resource rather than as a diagnostic or psychometric instrument.

This distinction is particularly important for teacher education. The purpose of the checklist is not to replace formal developmental assessment or psychological testing, nor is it intended to label or separate children according to perceived developmental limitations. Rather, it provides teachers with a structured way of attending to behaviours that might otherwise be noticed informally or inconsistently. Its practical value lies in helping teachers move from observation to interpretation and, subsequently, to an appropriate classroom response.

A major practical implication of the framework is therefore its potential to support customised teaching. When teachers systematically observe how children approach tasks, respond to materials, communicate ideas, engage in symbolic play, regulate emotions, or interact with peers, the resulting information can be used to adapt the next learning opportunity. Customisation may involve modifying activities, prompts, materials, language support, levels of scaffolding, or opportunities for practice according to the behaviour observed. This position is consistent with sociocultural views of learning in which appropriate guidance and scaffolding can extend children's emerging competencies (Vygotsky, 1978).

The teacher-training module developed as a practical extension of the observational framework further illustrates this process. The module was designed to demonstrate how each of the 16 observational indicators could be translated into an opportunity for observation and a corresponding strategy for supporting or developing the relevant skill. Brief classroom scenarios and suggested activities were included to help teachers move beyond recording a behaviour towards considering what could be offered next in the classroom. The module therefore operationalises the sequence observe → understand → customise → support → re-observe. It is presented as a developed teacher-support resource and not as an independently validated intervention.

This approach also has implications for inclusive classroom practice. By systematically observing children's developmental behaviours, teachers can identify differences in how children approach tasks without immediately interpreting those differences as deficits. Teachers can then customise activities, prompts, materials, language support, and levels of scaffolding so that children with diverse developmental and linguistic profiles have meaningful

opportunities to participate in classroom learning. In this context, inclusion is supported through responsive adaptation within the classroom rather than through separation or labelling. Such an approach is consistent with child-centred and inclusive principles emphasised in national educational frameworks (National Council of Educational Research and Training [NCERT], 2005, 2022).

The bilingual orientation of the framework is particularly relevant to this inclusive perspective. Children may demonstrate their thinking, emotions, symbolic understanding, or reasoning through the language in which they are most comfortable. A bilingual observation approach may help teachers distinguish differences in language expression from differences in the underlying behaviour being observed. This is consistent with the broader role of language and social interaction in children's learning and development (Vygotsky, 1978). At the same time, further research involving larger and more diverse samples is required to establish how consistently the framework functions across languages, regions, and classroom contexts.

The findings should therefore be understood as preliminary field evidence. The study demonstrates that the framework can be implemented systematically and can generate differentiated information across developmental domains. It does not establish diagnostic validity or broad psychometric validity. Its immediate contribution is practical: it provides a structured means of organising teacher observation and demonstrates how observed developmental behaviours can inform customised and inclusive classroom responses.

5. Conclusion

The study demonstrates an important transition from framework development to empirical classroom application. A structured bilingual observation checklist containing 16 indicators across four developmental domains was used consistently to examine classroom observations. The resulting data demonstrated meaningful variation across domains, with comparatively stronger observations in Symbolic Play and Social-Emotional Learning and comparatively lower observations in Centration and Conservation.

The overall reliability coefficient provided moderate internal consistency, while the low domain-level coefficients highlighted the preliminary nature of the instrument's psychometric evidence. The checklist is therefore best understood as a structured classroom observation framework, rather than as a fully validated developmental assessment instrument.

The principal contribution of the study lies in demonstrating how a theoretically grounded bilingual observation framework can be implemented in authentic early childhood classrooms to organise teacher observation and support reflection on children's developmental behaviours. Importantly, the framework is intended not merely to document what a child does, but to help teachers consider what to do next. Observed behaviours can inform the selection and customisation of classroom activities, prompts, materials, language support, and scaffolding according to children's observed needs.

The developed teacher-training module extends this practical orientation by illustrating how the 16 observational indicators can be connected to activities for observing the relevant behaviour and strategies for supporting its development. Thus, the framework provides a practical pathway from observation to customised teaching. The goal is not to label children or separate them, but to understand their observed needs and adapt teaching so that every child can participate meaningfully in classroom learning.

The framework also has implications for inclusive early childhood education. Systematic observation can help teachers recognise developmental and linguistic differences while maintaining children's participation within the shared classroom environment. Through responsive adaptation of activities, materials, prompts, language, and scaffolding, teachers may create greater opportunities for children with diverse developmental and linguistic profiles to engage in learning.

Future research should examine the framework with larger samples, across multiple early childhood settings and linguistic contexts, and should investigate inter-rater reliability, criterion-related evidence, and other forms of validity. Future studies may also examine whether systematic teacher training in the observation-to-instruction process results in measurable changes in teachers' instructional adaptations and children's classroom participation. Such research would help determine the extent to which the framework can be refined into a more robust observational resource for early childhood educators.

Overall, the study supports the value of structured bilingual observation as a bridge between developmental knowledge, customised teaching, and inclusive classroom practice.

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Domain Mean Score Percentage		
Symbolic Play	9.49	79.1%
Social-Emotional Learning	9.02	75.2%
Centration	7.88	65.7%
Conservation	7.51	62.6%

Annexure I – Master Structured Bilingual Observation Checklist

Supporting material for Paper 2

Set 1: English

Master Observational Checklist for Early Childhood Educators

Observational Rating Scale:

N = Not Yet Observed

E = Emerging (Observed occasionally with support)

C = Consistent (Demonstrates independently and regularly)

1. Centration (Cognitive Observation)

Focuses on a single, salient feature of an object or situation while ignoring other important attributes.

2. Conservation Tasks

Understands that physical properties (volume, mass, number) remain constant despite changes in shape or appearance.

3. Symbolic Play (Pretend / Imaginative Play)

Uses objects, actions, or ideas to represent other objects, people, or scenarios.

4. Social-Emotional Learning (SEL)

Demonstrates self-awareness, emotional regulation, empathy, and positive social interaction.

Not Yet = 1 Emerging or occasional 2 and consistent 3

Sample filled in sheet

Transitional Stage Learner

Student / Observation Information

Child Name / ID: Student B (Age: 6 years, 2 months)

Observer: Lead Teacher / Workshop Observer

Date & Time: July 21, 2026 | 11:15 AM

Setting: Guided Group Science/Math Station

Observation Checklist & Scoring

Domain 1: Centration & Perspective Taking

Domain 2: Conservation & Reversibility

Domain 3: Symbolic Play

Domain 4: Social-Emotional Learning & Regulation

Teacher Debrief & Next Steps (Coaching Flow) Transitional Stage Learner

Student / Observation Information

Child Name / ID: Student B (Age: 6 years, 2 months)

Observer: Lead Teacher / Workshop Observer

Date & Time: July 21, 2026 | 11:15 AM

Setting: Guided Group Science/Math Station

Observation Checklist & Scoring

Domain 1: Centration & Perspective Taking (ಕೇಂದ್ರೀಕರಣ ಮತ್ತು ದೃಷ್ಟಿಕೋನ ಗ್ರಹಿಕೆ / மையப்படுத்தல்)

Domain 2: Conservation & Reversibility (ಸಂರಕ್ಷಣೆ ಮತ್ತು ಹಿಮ್ಮುಖ ಆಲೋಚನೆ / மாறாத்தன்மை & மீள்சிந்தனை)

Domain 3: Symbolic Play (ಸಾಂಕೇತಿಕ ಆಟ / குறியீட்டு விளையாட்டு)

Domain 4: Social-Emotional Learning & Regulation (ಸಾಮಾಜಿಕ-ಭಾವನಾತ್ಮಕ ಕಲಿಕೆ / சமூக-உணர்ச்சி கற்றல்)

Teacher Debrief & Next Steps (Coaching Flow)

Reflect: Student B is actively transitioning into concrete operational thinking, self-correcting perceptual errors when given a moment to reflect.

Analyze: Demonstrates emerging conservation and strong reversibility. Possesses strong verbal self-regulation and collaborative problem-solving skills.

Micro-Shift Strategy: Challenge Student B with "Predict & Prove" questions ("Before we pour it back, mark where you think the water line will land with a tape marker").

Scoring Key for Teachers

1 = Emerging (ಆರಂಭಿಕ ಹಂತ / ஆரம்ப நிலை): Reliant on immediate perception, egocentric viewpoint, requires direct adult guidance.

2 = Developing (ಬೆಳೆಯುತ್ತಿರುವ ಹಂತ / வளர்ச்சி நிலை): Shows moments of decentralization, self-corrects with subtle prompts, uses flexible symbolic play.

3 = Consistent (ಸ್ಥಿರ ಹಂತ / நிலையான நிலை): Demonstrates conservation, reversibility, multi-attribute classification, and independent peer regulation.
Reflect: Student B is actively transitioning into concrete operational thinking, self-correcting perceptual errors when given a moment to reflect.
Analyze: Demonstrates emerging conservation and strong reversibility. Possesses strong verbal self-regulation and collaborative problem-solving skills.
Micro-Shift Strategy: Challenge Student B with "Predict & Prove" questions ("Before we pour it back, mark where you think the water line will land with a tape marker").
Scoring Key for Teachers
1 = Emerging: Reliant on immediate perception, egocentric viewpoint, requires direct adult guidance.
2 = Developing: Shows moments of decentralization, self-corrects with subtle prompts, uses flexible symbolic play.
3 = Consistent: Demonstrates conservation, reversibility, multi-attribute classification, and independent peer regulation.

Observational Indicator	Rating (N/ E/ C)	Notes / Classroom Examples
Focuses only on height or length when comparing items (e.g., chooses a taller glass regardless of width).		
Evaluates quantity based strictly on spatial layout (e.g., thinks a spread-out row of coins has "more").		
Struggles to classify objects using two attributes simultaneously (e.g., sorting by both color and shape).		
Concentrates on one aspect of a rule or event while neglecting surrounding context.		
Observational Indicator	Rating (N / E / C)	Notes / Classroom Examples
Conservation of Number: Recognizes that two equal rows of objects remain equal even if one row is spread out or bunched together.		
Conservation of Mass/Matter: Realizes that two equal balls of clay remain equal even when one is rolled into a long sausage shape.		
Conservation of Liquid/Volume: Understands that equal amounts of liquid remain equal when poured into containers of different shapes/heights.		
Reversibility Thinking: Can explain why the quantity didn't change (e.g., "If you pour it back, it's the exact same!").		
Observational Indicator	Rating (N / E / C)	Notes / Classroom Examples
Object Substitution: Uses neutral/unrelated objects to represent real items (e.g., uses a wooden block as a telephone).		
Role Play: Adopts and maintains distinct persona roles during play (e.g., doctor, teacher, parent, animal).		
Sociodramatic Sequences: Coordinates complex play scenarios with peers involving a sequence of actions (e.g., cooking a meal, serving, and paying).		
Abstract Symbolism: Uses gestures or words to represent imaginary objects/events without needing a physical tool.		
Observational Indicator	Rating (N / E / C)	Notes / Classroom Examples
Self-Awareness & Expression: Identifies and labels basic feelings (e.g., happy, sad, frustrated, scared) in self and others.		
Emotion Regulation: Uses taught strategies (e.g., deep breaths, quiet area) to calm down during transitions or conflicts.		
Empathy & Prosocial Behavior: Offers comfort, help, or sharing behavior when observing a peer in distress.		
Cooperative Interaction & Problem Solving: Takes turns, shares materials, and uses words to resolve simple peer disagreements.		
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
1a. Attribute Sorting	3 (Consistent)	Sorted plastic animals first by habitat (land vs. water). When asked for a "secret new rule, " successfully re-sorted them by size (large vs. small).
1b. Perspective Taking	2 (Developing)	Initially claimed his partner saw the exact same picture on a 2-sided board. After walking around to the other

		side, paused and said, "Oh, you see the cat, I see the dog!"
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
2a. Number & Mass Conservation	2 (Developing)	When water was poured from a short, wide glass into a tall, thin cylinder, Student B hesitated. Said, "It looks like more... but wait, you didn't add any water."
2b. Reversibility	3 (Consistent)	Stated: "If you pour it back into the blue glass, it will be at the same mark." Correctly verified by pouring back.
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
3a. Object Substitution	3 (Consistent)	Created an entire "grocery store" using blank index cards as money, leaves as vegetables, and a cardboard box as a barcode scanner.
3b. Role-Play & Narrative	3 (Consistent)	Co-created a multi-step narrative with two peers: "I'm the shopkeeper, you're buying soup ingredients, but the store is out of salt." Sustained story for 12+ minutes.
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
4a. Emotional Literacy & Self-Regulation	2 (Developing)	Expressed annoyance when a peer took a green leaf from his store: "I was using that!" Took a pause, stated his boundary verbally without shouting.
4b. Peer Collaboration & Empathy	3 (Consistent)	Used the 4-step problem-solving model with a peer to decide who gets to hold the "cashier box" first by setting a 3-minute timer.
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
1a. Attribute Sorting	3 (Consistent)	Sorted plastic animals first by habitat (land vs. water). When asked for a "secret new rule, " successfully re-sorted them by size (large vs. small).
1b. Perspective Taking	2 (Developing)	Initially claimed his partner saw the exact same picture on a 2-sided board. After walking around to the other side, paused and said, "Oh, you see the cat, I see the dog!"
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
2a. Number & Mass Conservation	2 (Developing)	When water was poured from a short, wide glass into a tall, thin cylinder, Student B hesitated. Said, "It looks like more... but wait, you didn't add any water."
2b. Reversibility	3 (Consistent)	Stated: "If you pour it back into the blue glass, it will be at the same mark." Correctly verified by pouring back.
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
3a. Object Substitution	3 (Consistent)	Created an entire "grocery store" using blank index cards as money, leaves as vegetables, and a cardboard box as a barcode scanner.
3b. Role-Play & Narrative	3 (Consistent)	Co-created a multi-step narrative with two peers: "I'm the shopkeeper, you're buying soup ingredients, but the store is out of salt." Sustained story for 12+ minutes.
Indicator	Rating (1–3)	Specific Behavioral Evidence / Field Notes
4a. Emotional Literacy & Self-Regulation	2 (Developing)	Expressed annoyance when a peer took a green leaf from his store: "I was using that!" Took a pause, stated his boundary verbally without shouting.
4b. Peer Collaboration & Empathy	3 (Consistent)	Used the 4-step problem-solving model with a peer to decide who gets to hold the "cashier box" first by setting a 3-minute timer.

Annexure II – Teacher Training Module

Structured Bilingual Classroom Observation: From Observation to Instruction

Training Module – Slide 1

From Observation to Instruction

Structured Bilingual Classroom Observation Teacher Training Module

16 indicators • 4 developmental domains • Observe → Interpret → Respond

Structured Bilingual Classroom Observation | Teacher Training Module | 1

Training Module – Slide 2

Purpose of the Training Module

Turning structured observation into responsive classroom practice

What teachers observe

Centration - attention to features, quantity, attributes and context. Conservation - number, mass, liquid/volume and reversibility. Symbolic Play - objects, roles, sequences and abstract symbolism. SEL - emotional awareness, regulation, empathy and cooperation.

What teachers do next

Record observable behavioural evidence rather than labels. Interpret the developmental behaviour represented by the indicator. Respond with a simple, appropriate classroom strategy. Re-observe to notice change and plan the next learning opportunity.
Structured Bilingual Classroom Observation | Teacher Training Module | 2

Training Module – Slide 3

The Observation-to-Instruction Cycle
Structured observation
Create or notice a natural classroom opportunity. Observe what the child actually does or says. Record the evidence using the relevant indicator. Allow bilingual/home-language expression where appropriate.
Responsive teaching
Identify the skill that needs strengthening. Choose a developmentally appropriate activity. Provide prompts, modelling or scaffolding. Re-observe to notice change over time.
Structured Bilingual Classroom Observation | Teacher Training Module | 3

Training Module – Slide 4

Domain 1 - Centration
Four indicators: observe how children attend to one or multiple features
Activities to observe
1. Height/length - compare equal quantities in differently shaped containers. 2. Spatial layout - compare equal rows of counters, spread out versus close together. 3. Two attributes - sort blocks by colour, shape, then both. 4. Rule/context - use a simple rule and introduce a "What if…?" variation.
Strategies to develop
Ask children to predict before checking. Re-sort the same materials using a new rule. Use two-criterion sorting games. Use stories and "What would change if…?" questions.
Structured Bilingual Classroom Observation | Teacher Training Module | 4

Training Module – Slide 5

Domain 2 - Conservation & Reversibility
Observe whether children rely on appearance or reason about quantity
Activities to observe
5. Number - spread one of two equal rows of counters. 6. Mass/matter - reshape one of two equal clay balls. 7. Liquid/volume - pour equal liquid into differently shaped containers. 8. Reversibility - change an arrangement and ask how it could be restored.
Strategies to develop
Use a Predict → Do → Check sequence. Ask: "Did we add or remove anything?" Encourage children to physically verify their reasoning. Ask: "What would happen if we put it back?"
Structured Bilingual Classroom Observation | Teacher Training Module | 5

Training Module – Slide 6

Domain 3 - Symbolic Play
Observe representation through objects, roles, sequences and abstract symbols
Activities to observe
9. Object substitution - provide blocks, boxes, fabric and sticks during open-ended play. 10. Role play - offer a pretend clinic, shop, school or home setting. 11. Sociodramatic sequences - observe a multi-step scenario created with peers. 12. Abstract symbolism - represent an object/action using gesture, sound or words.
Strategies to develop
Ask: "What else could this be?" Rotate roles and encourage children to sustain them. Use beginning–middle–end story cards. Use mime and "pretend without props" games.
Structured Bilingual Classroom Observation | Teacher Training Module | 6

Training Module – Slide 7

Domain 4 - Social-Emotional Learning
Observe emotional awareness, regulation, empathy and cooperative problem solving
Activities to observe
13. Self-awareness & expression - use emotion cards or stories to identify feelings. 14. Emotion regulation - observe during transitions, waiting or minor frustration. 15. Empathy & prosocial behaviour - use a story or natural situation involving a distressed peer. 16. Cooperation & problem solving - give pairs a shared task requiring turn-taking.
Strategies to develop
Build an everyday emotion vocabulary. Practise breathing, pausing and calming routines before they are needed. Ask: "What might your friend be feeling?" Teach: Stop → Listen → Suggest → Agree.
Structured Bilingual Classroom Observation | Teacher Training Module | 7

Training Module – Slide 8

Bilingual Observation
Language should support observation-not become a barrier to demonstrating competence
During observation
Allow children to respond in the language in which they can express their thinking most comfortably. Record the language used when relevant to understanding the behaviour. Attend to non-verbal demonstration as well as verbal explanation. Distinguish developmental behaviour from limited second-language vocabulary.

Teacher practice
Use familiar words and visual/material prompts. Invite explanation in the home language and connect it to classroom language where possible. Do not treat bilingual expression as evidence of confusion. Use observations to plan richer language and cognitive opportunities.
Structured Bilingual Classroom Observation | Teacher Training Module | 8

Training Module – Slide 9
Record Evidence, Not Labels
The checklist is an observational framework-not a diagnostic test
Prefer
"Spread the counters and said, 'This row has more.'" "Used a block as a telephone during pretend play." "Paused, took a breath and then used words to resolve the disagreement." Specific words, actions, context and prompts.
Avoid
"Poor conservation." "Immature." "Cannot understand." Interpretations without observable behavioural evidence.
Structured Bilingual Classroom Observation | Teacher Training Module | 9

Training Module – Slide 10
From One Observation to One Teaching Response
A simple coaching flow for teachers
Observation
Situation: Equal water is placed in a short-wide and a tall-thin container. Evidence: Child says the taller container has more because the water level is higher. Interpretation: Observation suggests reliance on visual appearance for quantity judgement.
Responsive strategy
Activity: Predict → pour → check using several container shapes. Prompt: "Did we add any water? How could we find out?"
Next observation: revisit the task and record whether the child explains the quantity using evidence.
Structured Bilingual Classroom Observation | Teacher Training Module | 10

Training Module – Slide 11
Teacher Reflection & Debrief
The purpose is better observation and better teaching-not labelling children
What behaviour did I actually observe? Which checklist indicator best describes the behaviour? What support, if any, was provided? What activity could give the child another opportunity to practise the skill? What change would I look for when I observe again? How can I adapt the activity to the child's language, interests and classroom context?
Structured Bilingual Classroom Observation | Teacher Training Module | 11

Training Module – Slide 12
Observe → Understand → Respond
Structured observation becomes meaningful when it leads to responsive opportunities for learning. The goal is not to label the child, but to understand the behaviour and decide what to teach next.
Structured Bilingual Classroom Observation | Teacher Training Module | 12

Annexure III – Master Observation Data: 41 Classroom Observations
Supporting dataset used for the analysis reported in Paper 2.

Worksheet: Item_Level_Data

Teacher_ID	C1	C2	C3	C4	Centration_Total	CS1	CS2	CS3	CS4	Conservation_Total	SP1	SP2	SP3	SP4	SymbolicPlay_Total	SEL1	SEL2	SEL3	SEL4	SEL_Total	Grand_Total
T01	2	2	2	2	=SUM (B2:E2)	2	2	1	1	=SUM (G2:J2)	3	3	2	2	=SUM (L2:O2)	3	3	2	3	11	35
T02	1	3	2	3	=SUM (B3:E3)	2	2	3	1	=SUM (G3:J3)	3	1	3	2	=SUM (L3:O3)	3	3	3	3	=SUM (Q3:T3)	=SUM(F3, K3, P3, U3)
T03	1	1	3	2	=SUM (B4:E4)	1	1	2	1	=SUM (G4:J4)	3	3	3	2	=SUM (L4:O4)	3	3	3	3	=SUM (Q4:T4)	=SUM(F4, K4, P4, U4)
T04	2	3	1	2	=SUM (B5:E5)	1	2	3	1	=SUM (G5:J5)	1	2	2	1	=SUM (L5:O5)	1	2	1	2	=SUM (Q5:T5)	=SUM(F5, K5, P5, U5)
T05	3	1	3	2	=SUM (B6:E6)	1	3	3	1	=SUM (G6:J6)	3	2	3	3	=SUM (L6:O6)	1	3	2	3	=SUM (Q6:T6)	=SUM(F6, K6, P6, U6)
T06	1	1	3	3	=SUM (B7:E7)	1	3	3	2	=SUM (G7:J7)	3	3	3	3	=SUM (L7:O7)	3	2	3	3	=SUM (Q7:T7)	=SUM(F7, K7, P7, U7)

T07	2	3	1	3	=SUM (B8:E8)	2	3	2	1	=SUM (G8:J8)	2	3	3	3	=SUM (L8:O8)	2	3	3	2	=SUM (Q8:T8)	=SUM(F8, K8, P8, U8)
T08	1	1	3	2	=SUM (B9:E9)	1	2	3	3	9	2	3	3	2	10	1	3	3	2	=SUM (Q9:T9)	=SUM(F9, K9, P9, U9)
T09	1	2	2	1	=SUM (B10:E10)	2	2	3	2	=SUM (G10:J10)	1	2	3	2	=SUM (L10:O10)	3	2	3	2	=SUM (Q10:T10)	=SUM(F10, K10, P10, U10)
T10	2	3	3	3	=SUM (B11:E11)	3	2	3	2	=SUM (G11:J11)	1	3	3	3	=SUM (L11:O11)	1	2	3	3	=SUM (Q11:T11)	=SUM(F11, K11, P11, U11)
T11	1	3	3	3	=SUM (B12:E12)	1	2	3	2	=SUM (G12:J12)	3	3	3	3	=SUM (L12:O12)	2	3	3	3	=SUM (Q12:T12)	=SUM(F12, K12, P12, U12)
T12	1	2	2	1	=SUM (B13:E13)	1	1	3	3	=SUM (G13:J13)	3	1	3	2	=SUM (L13:O13)	1	3	2	2	=SUM (Q13:T13)	=SUM(F13, K13, P13, U13)
T13	1	2	3	3	=SUM (B14:E14)	2	1	3	2	=SUM (G14:J14)	1	2	3	3	=SUM (L14:O14)	1	2	2	2	=SUM (Q14:T14)	=SUM(F14, K14, P14, U14)
T14	1	2	2	3	=SUM (B15:E15)	2	2	3	2	=SUM (G15:J15)	2	3	2	2	=SUM (L15:O15)	1	3	3	3	=SUM (Q15:T15)	=SUM(F15, K15, P15, U15)
T15	1	2	3	3	=SUM (B16:E16)	2	1	3	2	=SUM (G16:J16)	2	3	3	3	=SUM (L16:O16)	2	2	3	2	=SUM (Q16:T16)	=SUM(F16, K16, P16, U16)
T16	2	2	3	3	10	2	2	3	2	9	3	3	3	3	=SUM (L17:O17)	3	2	3	3	=SUM (Q17:T17)	=SUM(F17, K17, P17, U17)
T17	1	1	2	2	=SUM (B18:E18)	1	1	2	1	=SUM (G18:J18)	2	2	3	3	=SUM (L18:O18)	1	2	3	3	=SUM (Q18:T18)	=SUM(F18, K18, P18, U18)
T18	1	1	3	2	7	1	2	3	1	=SUM (G19:J19)	2	3	3	3	=SUM (L19:O19)	2	2	3	3	=SUM (Q19:T19)	=SUM(F19, K19, P19, U19)
T19	1	1	2	1	=SUM (B20:E20)	1	1	1	1	=SUM (G20:J20)	2	2	3	2	=SUM (L20:O20)	1	2	3	2	=SUM (Q20:T20)	=SUM(F20, K20, P20, U20)
T20	1	1	2	3	=SUM (B21:E21)	1	2	2	1	=SUM (G21:J21)	1	2	3	2	=SUM (L21:O21)	1	1	3	1	=SUM (Q21:T21)	=SUM(F21, K21, P21, U21)
T21	2	1	3	2	=SUM (B22:E22)	1	1	2	2	=SUM (G22:J22)	2	3	3	3	=SUM (L22:O22)	2	2	3	2	=SUM (Q22:T22)	=SUM(F22, K22, P22, U22)
T22	2	2	3	2	=SUM (B23:E23)	2	1	3	2	=SUM (G23:J23)	1	2	3	3	=SUM (L23:O23)	1	2	2	2	=SUM (Q23:T23)	=SUM(F23, K23, P23, U23)
T23	2	1	3	1	=SUM (B24:E24)	2	1	2	2	=SUM (G24:J24)	1	2	3	3	=SUM (L24:O24)	1	2	3	2	=SUM (Q24:T24)	=SUM(F24, K24, P24, U24)
T24	2	1	3	3	=SUM (B25:E25)	1	1	3	3	=SUM (G25:J25)	2	3	3	2	=SUM (L25:O25)	2	3	3	1	=SUM (Q25:T25)	=SUM(F25, K25, P25, U25)
T25	1	1	2	1	=SUM (B26:E26)	1	2	2	1	=SUM (G26:J26)	1	2	2	2	7	1	2	2	1	=SUM (Q26:T26)	=SUM(F26, K26, P26, U26)
T26	1	2	2	3	=SUM (B27:E27)	1	2	3	1	=SUM (G27:J27)	2	2	3	2	=SUM (L27:O27)	1	1	3	3	=SUM (Q27:T27)	=SUM(F27, K27, P27, U27)
T27	1	2	3	1	=SUM (B28:E28)	3	1	3	2	=SUM (G28:J28)	2	3	3	2	=SUM (L28:O28)	2	3	3	3	=SUM (Q28:T28)	=SUM(F28, K28, P28, U28)
T28	2	2	1	1	=SUM (B29:E29)	1	1	1	1	=SUM (G29:J29)	1	1	3	2	=SUM (L29:O29)	1	2	2	1	=SUM (Q29:T29)	=SUM(F29, K29, P29, U29)
T29	2	1	2	3	=SUM (B30:E30)	1	2	2	2	=SUM (G30:J30)	2	3	3	3	=SUM (L30:O30)	1	2	3	3	=SUM (Q30:T30)	=SUM(F30, K30, P30, U30)

T30	1	1	2	1	=SUM (B31:E31)	1	2	2	1	=SUM (G31:J31)	1	2	3	2	=SUM (L31:O31)	1	1	3	2	=SUM (Q31:T31)	=SUM(F31, K31, P31, U31)
T31	2	3	1	2	=SUM (B32:E32)	1	2	2	1	=SUM (G32:J32)	3	3	3	2	=SUM (L32:O32)	3	1	3	3	=SUM (Q32:T32)	=SUM(F32, K32, P32, U32)
T32	2	3	2	2	=SUM (B33:E33)	2	2	2	2	=SUM (G33:J33)	3	1	2	1	=SUM (L33:O33)	2	1	3	2	=SUM (Q33:T33)	=SUM(F33, K33, P33, U33)
T33	2	2	3	2	=SUM (B34:E34)	2	1	3	2	=SUM (G34:J34)	3	3	3	1	=SUM (L34:O34)	2	3	3	3	11	=SUM(F34, K34, P34, U34)
T34	1	2	3	3	=SUM (B35:E35)	1	1	3	3	=SUM (G35:J35)	2	3	2	3	=SUM (L35:O35)	3	3	3	3	12	=SUM(F35, K35, P35, U35)
T35	2	1	3	1	=SUM (B36:E36)	2	3	2	1	=SUM (G36:J36)	3	2	3	1	=SUM (L36:O36)	2	3	2	3	10	34
T36	2	2	1	1	=SUM (B37:E37)	2	1	1	2	=SUM (G37:J37)	3	3	2	1	=SUM (L37:O37)	3	3	3	1	10	31
T37	3	3	3	2	=SUM (B38:E38)	2	3	2	3	=SUM (G38:J38)	3	2	2	3	=SUM (L38:O38)	2	2	3	2	9	40
T38	2	3	2	2	=SUM (B39:E39)	2	2	2	3	=SUM (G39:J39)	2	1	3	1	=SUM (L39:O39)	3	2	1	2	8	33
T39	2	3	1	2	=SUM (B40:E40)	2	3	2	2	=SUM (G40:J40)	3	2	2	3	=SUM (L40:O40)	1	2	3	1	7	34
T40	2	1	1	2	=SUM (B41:E41)	2	3	2	1	=SUM (G41:J41)	3	2	2	2	=SUM (L41:O41)	2	2	2	2	8	31
T41	3	2	3	2	=SUM (B42:E42)	1	3	2	3	=SUM (G42:J42)	2	1	2	3	=SUM (L42:O42)	2	2	3	2	9	36

Annexure IV – Data Analysis Tables
Supporting statistical tables for Paper 2.

Annexure IV

Data Analysis Tables
This annexure presents the supporting statistical tables derived from the 41 completed classroom observation records used in the study. The tables provide detailed statistical support for the findings presented in Chapter 4 and include item-level descriptive statistics, internal consistency analysis, domain-wise developmental profiles, and inter-domain correlations.

Table IV.1
Item-Level Descriptive Statistics of the 16-Item Bilingual Observation Framework (N = 41)

Summary: Item means ranged from 1.537 to 2.732. SP3 recorded the highest mean (M = 2.732, SD = 0.449), while CS1 recorded the lowest (M = 1.537, SD = 0.596). The findings indicate variation in the frequency and consistency of observed behaviours across the 16 indicators.

Table IV.2
Internal Consistency Reliability of the 16-Item Bilingual Observation Framework

Summary: The overall Cronbach's alpha of 0.672 indicates moderate preliminary internal consistency. The findings were interpreted cautiously because the framework represents four conceptually distinct developmental domains rather than a single homogeneous psychological construct. All 16 items were retained for the present exploratory study.

Table IV.3
Domain-Wise Developmental Profile Based on the Bilingual Observation Framework

Note. Developmental Index = (Mean Domain Score / Maximum Possible Domain Score) × 100. The bands were used descriptively and were not treated as diagnostic classifications.

Summary: Symbolic Play showed the highest developmental index (79.1%), followed by Social-Emotional Learning (75.2%), Centration (65.7%), and Conservation (62.6%). Symbolic Play and SEL showed a greater concentration of observations in the consistent band, whereas Centration and Conservation showed greater representation in the occasional band.

Table IV.4
Spearman's Rank-Order Correlation Matrix Among the Four Developmental Domains (N = 41)

Note. *p < .05, ***p < .001. Spearman's rho was used because the observation ratings were ordinal and some domain-score distributions were non-normal.

Summary: The strongest association was observed between Symbolic Play and SEL (ρ = .623, p < .001), followed by Centration and Conservation (ρ = .566, p < .001). The remaining associations were positive but weaker, with some not reaching statistical significance. The findings indicate that the four domains were interrelated but distinguishable within the observed sample.

Overall Annexure Summary

The supporting analyses demonstrate variation across the 16 observation indicators and provide a descriptive profile of the four developmental domains. The framework showed moderate preliminary internal consistency (α = 0.672), while the domain-level findings indicated relatively higher observed levels of Symbolic Play and SEL and greater variability in Centration and Conservation. The correlation analysis further indicated that the developmental domains were related to varying degrees. These findings provide the statistical basis for the interpretations presented in Chapter 4 and support the use of the framework as a structured classroom observation and instructional-support tool, rather than as a diagnostic or labelling instrument.

r	Mean	SD	Minimum	Maximum	Skewness	Kurtosis
C1	1.610	0.628	1	3	0.519	-0.567
C2	1.854	0.792	1	3	0.272	-1.341
C3	2.317	0.756	1	3	-0.612	-0.970
C4	2.098	0.768	1	3	-0.171	-1.255
CS1	1.537	0.596	1	3	0.599	-0.530
CS2	1.829	0.738	1	3	0.286	-1.075
CS3	2.390	0.666	1	3	-0.642	-0.570
CS4	1.756	0.734	1	3	0.423	-1.002
SP1	2.146	0.792	1	3	-0.272	-1.341
SP2	2.317	0.722	1	3	-0.569	-0.856
SP3	2.732	0.449	2	3	-1.086	-0.865
SP4	2.293	0.716	1	3	-0.503	-0.871
SEL1	1.805	0.813	1	3	0.381	-1.379
SEL2	2.244	0.663	1	3	-0.311	-0.685
SEL3	2.683	0.567	1	3	-1.646	1.891
SEL4	2.293	0.716	1	3	-0.503	-0.871

Indicator	Value
Overall Cronbach's Alpha	0.672
Lowest Corrected Item–Total Correlation	-0.001
Highest Corrected Item–Total Correlation	0.468

Domain	Mean Score / 12	Developmental Index	Emerging	Occasional	Consistent
Symbolic Play	9.49	79.1%	0.0%	22.0%	78.0%
Social-Emotional Learning	9.02	75.2%	0.0%	36.6%	63.4%
Centration	7.88	65.7%	7.3%	53.7%	39.0%
Conservation	7.51	62.6%	9.8%	63.4%	26.8%

Developmental Domain	Centration	Conservation	Symbolic Play	SEL
Centration	1.000	0.566***	0.336*	0.273
Conservation	0.566***	1.000	0.122	0.224
Symbolic Play	0.336*	0.122	1.000	0.623***
SEL	0.273	0.224	0.623***	1.000