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EVIDENCE SUMMARY

What Works in Pre-Primary Education Pedagogical Practices

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Brief Description

Pre-primary education is widely recognized as an important part of the continuum of early childhood development (ECD). This brief summarizes research-based evidence on effective, equitable, and inclusive instructional practices for school readiness, with a particular focus on pre-literacy, pre-numeracy, and social-emotional skills.

This document contains the following sections:

1. Importance of Pre-Primary Education

2. What Are Pedagogical Practices in Pre-Primary Education?

3. Research Findings on Effective Pre-Primary Pedagogical Practices

4. Guidance on Effective Pre-Primary Literacy, Numeracy, and Social Emotional Learning (SEL) Instructional Strategies (Implementation Tips)

5. Additional Research Needs

SECTION 1:
Importance of Pre-Primary Education

USAID defines **pre-primary education** as the 1–3 years of organized schooling immediately prior to primary school (typically ages three to six) that supports physical, social-emotional, cognitive, language, and gross or fine motor development and encourages self-regulation and a positive approach to

RELATED USG AND USAID GOALS

USAID's programming in pre-primary education supports the achievement of development objectives described in the U.S. Government (USG) Strategy on International Basic Education and in the 2018 USAID Education Policy. This brief also supports the Foundational Skills Learning Agenda question 5: "What pre-primary outcomes are most important for ensuring improved foundational skills amongst all learners in later years?"

learning.[1] Pre-primary education, marked by pedagogy that is developmentally appropriate and tailored to the age and needs of the children it serves, is widely recognized as a means to provide young children with the foundational skills they need for school readiness and school success and is considered a promising avenue for reducing social, academic, and economic inequalities across the lifespan.[2]

📕 KEY TERMS

The terms below reflect the way USAID uses them but there is variation in their definition across contexts.

- **Early Childhood Development (ECD)** is used to describe both the process of development and programs designed to support young children from birth through age eight. ECD programs generally include services from one or more sectors including health, nutrition, child safety, and education.
- **Early childhood care and education (ECCE)** programs commonly focus on meeting the developmental needs of children from birth to age six through positive and safe caregiving and cognitive stimulation.
- **Pre-primary or early childhood education (ECE)** programs commonly emphasize the physical, social, cognitive, and language skills three to six-year-olds need for school success.
- **Preschool education** programs commonly focus on educating children from age three through age six (though children as young as two can attend in some areas) by combining learning and play.

Although ECCE and pre-primary or ECE programs are related in that they both address the developmental needs of young children, ECCE programs typically offer a wider range of services than pre-primary or ECE programs, which tend to focus on preparing children for formal education settings.[3]

This report focuses on pre-primary education practices.

Considerable evidence from high-income countries (HICs) and growing evidence from low- and middle-income countries (LMICs) supports the immediate and long-term benefits of attending at least one year of high-quality pre-primary education.[4] The benefits of high-quality pre-primary education are typically even greater for learners from marginalized and vulnerable populations, who may not have the same opportunities as their peers to develop the skills, attitudes, and behaviors that prepare them for school.[5] There is also evidence that pre-primary attendance supports specific school readiness skills, including language and literacy,[6] numeracy,[7] and social-emotional development.[8] Long-term benefits include greater educational attainment, health, and wealth.[9] For example, school readiness programs were associated with

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[1] USAID, 2018, 2021
[2] OECD, 2021; USAID, 2021; Yoshikawa et al., 2018
[3] OECD, 2021; USAID, 2018, 2021
[4] Deming, 2009; Earle, Milovantseva, & Heymann, 2018; Grantham-McGregor et al., 2007; McCoy et al., 2017; Rao et al., 2014
[5] van Huizen & Plantenga, 2018; Yoshikawa et al., 2013
[6] Engle et al., 2011; Opel, Ameer, & Aboud, 2009; UNICEF, 2019
[7] Aboud & Hossain, 2011; Berlinski, Galiani, & Gertler, 2009; MacDonald & Murphy, 2019; Opel et al., 2012
[8] Arapa et al., 2021; Wolf et al., 2021
[9] Arnold et al., 2007; Hjalmarsson & Lochner, 2011; Knudsen et al., 2006; Krafft, 2015

lower rates of grade repetition in Nepal[10] and lower rates of primary school drop-out in Cambodia.[11] Findings from a large, longitudinal study in Chile indicated that children who attended at least one year of pre-school demonstrated significantly higher math and reading scores in fourth grade.[12] A recent meta-analysis of the effects of literacy interventions in LMICs, a majority of which targeted literacy instruction, suggests that programs were most effective for emergent literacy skills.[13] Despite this evidence, most children in LMICs do not have access to pre-primary education and, therefore, are not prepared to begin primary school.[14]

USAID's Center for Education recognizes pre-primary education as part of basic education and supports group-based programming for children ages three to six[15] International organizations like the United Nations, UNESCO, UNICEF, and INEE also highly value pre-primary education, as evidenced by its centrality to their mission. Yet, access to pre-primary education programs remains inequitable and is still relatively limited in LMICs.[16] The quality of pre-primary education around the world, and especially in LMICs, is also variable and often quite poor, in part because quality indicators such as developmentally appropriate practice or warm and responsive adult-child interactions can be difficult to implement at scale without national or financial support.[17]

SECTION 2:
What Are Pedagogical Practices in Pre-Primary Education?

Broadly, **pedagogical practices** refer to the strategies and techniques used to support young children's development and learning.[18] These practices build on the skills children acquire between birth and age three, including trust through relationship building, communication through exposure to words, talk, gestures, and signing, emotional knowledge through emotion identification, and cooperation through play. Effective pre-primary pedagogical practices also support the development of new skills needed for school success, including letter recognition, counting, and self-control.

📕 DEFINING PRE-PRIMARY SKILLS

- **Pre-literacy** refers to a set of emergent language and literacy skills that include receptive and expressive skills in signed, spoken, and tactile[19] languages, including non-verbal communication, vocabulary, narrative skills (e.g., telling stories, knowing the order of events), the ability to identify letters, knowledge of the alphabet, print motivation (i.e., an interest in books), print awareness (e.g., handling books, understanding the direction of print), and, often, an awareness of individual sounds in words (phonemic awareness).[20]

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[10] Save the Children, 2003
[11] Nonoyama-Tarumi & Bredenberg, 2009
[12] Cortazar, 2015
[13] Kim, Lee, & Zuilkowski, 2020
[14] UNESCO, 2012, 2017
[15] USAID, 2018
[16] Global Education Monitoring Report Team 2020; UNICEF, 2019
[17] Spier et al., 2019; Yoshikawa & Kabay, 2014; Yoshikawa et al., 2018
[18] Siraj-Blatchford et al., 2002
[19] Tactile learning is learning from one's own physical experience, including touch and movement.
[20] Snow, Burns, & Griffin, 1998; UNICEF, 2012

- **Pre-numeracy**, or early numeracy, refers to a range of emergent numeracy skills, including expressive counting (forward and backward), recognizing number symbols, understanding quantities (e.g., this group has more or this group has less), being able to identify number patterns, and understanding the concept of adding or subtracting objects from a set.[21]
- **Social-emotional skills** refers to a set of skills that includes the ability to manage emotions (typically with adult support), follow directions, sustain attention, persist at a task, establish and maintain adult and peer relationships, and effectively join and contribute to groups.[22]

Curricular frameworks, or standards that clearly define expected learning outcomes, are an essential component of high-quality, pre-primary education because they can help establish values, expectations, and approaches for educational practice.[23] These frameworks or standards should be informed by children's experiences, which are rooted in their individual needs, strengths, interests, language, and culture.[24] In other words, they should be child-centered rather than adult-driven.

In a recent survey of OECD countries, nearly all had at least one curricular framework for three to five-year-olds that guided their pre-primary programming.[25] Not all LMICs have curricular frameworks, however, which can reduce the quality of pre-primary education. Although useful for guiding learning outcomes, these frameworks commonly focus on the provision of learning experiences that support broad concepts such as knowledge acquisition, key competency and skill areas, interactions with adults and peers, and the experiences and resources offered in the classroom, rather than on specific *pedagogical practices* that support pre-literacy, pre-numeracy, and social-emotional skills.[26]

Ideally, educators should be trained on effective pedagogical practices during teacher education or certification programs, which are typically supported at the national level. Because pedagogical practices can vary considerably across settings and contexts due to variations in needs, expectations, resources, class sizes, etc., training on effective practices at the local level is also recommended. This might include professional development sessions and printed resources for educators to take and adapt to their own classrooms or learning contexts.

> Unless clear pedagogical *practices* are identified and are directly linked with curricular frameworks, consistent improvements in the quality of pre-primary education will be challenging.

SECTION 3:
Research Findings on Effective Pre-Primary Pedagogical Practices

Though pedagogical practices differ considerably across countries, cultures, and individual settings,[27] characteristics of effective pedagogy are fairly consistent. These practices include (1) nurturing and consistent relationships, (2) interactions with learning materials, (3) positive classroom environments, (4) domain-specific language (spoken and signed), and (5) pre-literacy and pre-numeracy stimulation.[28] Effective

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[21] Ginsburg, Lee, & Boyd, 2008; National Research Council, 2001; Raghubar & Barnes, 2017
[22] Denham, Bassett, & Wyatt, 2015; Raver 2004
[23] OECD, 2021; Thomas, 2021
[24] OECD, 2015; Tobin, Hsueh, & Karasawa, 2009
[25] OECD, 2021
[26] Wood & Hedges, 2016
[27] OECD, 2014
[28] OECD, 2015; Shonkoff & Phillips, 2000

practices are commonly child-centered, developmentally appropriate, play-based, and take a holistic view of the child. Equitable and inclusive pedagogical practices promote all children's participation, recognize each child's strengths, capabilities, and interests, and celebrate diversity in their family, community, and culture.[29]

Despite increased attention to pedagogical practices, there is a limited amount of evidence on effective pedagogical strategies outside of HICs.[30] Nevertheless, three theoretical perspectives commonly guide pre-primary education around the world: Vygotsky's sociocultural theory,[31] Bronfenbrenner's ecological contexts model,[32] and the Reggio Emilia approach.[33] Each of these theories highlights the value of interactions between adults and children, among children, and with learning materials, and supports the idea that children actively construct knowledge through the world around them. Elements of each of these perspectives can be found in pedagogical practices around the world and can be summarized into four broad categories of practice, described below.

Child-centered pedagogical approaches produce greater learning and more positive social-emotional skills than do teacher-directed approaches.[34] A child-centered approach to pre-primary education builds on each child's strengths by connecting their experiences in school with their home and community settings. Not only do these connections send a message to children that they are valued, they also offer a sense of safety, which is essential for children to learn. Moreover, a child-centered approach to learning rests on the notion that curiosity and creativity are essential components of

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SUMMARY OF KEY FINDINGS AND RELATED IMPLEMENTATION PRACTICES

Key Findings

1. Child-centered pedagogical approaches produce greater learning and more positive social-emotional skills than teacher-directed approaches.

2. Positive interactions with adults and peers in pre-primary settings are essential for creating a safe and secure environment that supports children's pre-literacy, pre-numeracy, and social-emotional skills at school entry.

3. Evidence from both HICs and LMICs has clearly demonstrated the importance of play during the pre-primary years.

4. Developmentally appropriate, equitable, and inclusive practices must guide pre-primary pedagogy to provide the foundational skills all children need to succeed in school.

Implementation Practices

1. Create a literacy-, math-, and emotion-rich classroom environment.

2. Include shared book reading.

3. Apply talk, sing, sign or gesture strategies.

4. Teach children to view their world mathematically.

5. Teach the many aspects of math, not just numbers (i.e., numbers, operations, patterns, shapes, and measurement).

6. Create a community of caring.

7. Build positive relationships among teachers and students as well as peers.

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[29] Hedges & Cullen, 2005
[30] OECD, 2014
[31] Vygotsky,1980
[32] Bronfenbrenner, 1992
[33] Edwards, 1993
[34] Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Hur, Buettner, & Jeon, 2015; Paris & Alim, 2017; Yang & Hu, 2019

learning.[35] When teachers build lessons around the interests of children in their class (e.g., a unit on the ocean because a child is interested in fish or a unit on transportation because a child is interested in airplanes), children get excited about learning, engage in that learning, and recall the information for longer. Additionally, classrooms that emphasize responsibility and choice, where democratic norms are practiced and children have a say in the academic content and class structure, predict greater self-regulated learning and lower rates of peer rejection.[36] Child-centered pedagogical approaches also support positive teacher-child interactions,[37] a second guiding principle of effective pedagogical practices. Although child-centered practices are highly effective, adult-facilitated learning, in which educators provide children with essential support to extend learning, can also foster positive development and prepare children for primary school. Specifically, careful planning of the environment, daily activities, and schedules that provide children with regular opportunities to engage in exploration, interaction, and play is necessary to promote each child's learning and development. Adult-directed practices may be especially important for children who need additional support for learning and in contexts where class sizes are large, making child-centered learning more challenging.

Positive interactions with adults and peers in pre-primary settings are essential for creating a safe and secure environment that supports children's pre-literacy, pre-numeracy, and social-emotional skills at school entry.[38] Positive teacher-child relationships are commonly marked by high levels of closeness and low levels of conflict between teachers and children.[39] The Teaching Through Interactions (TTI) conceptual framework is frequently used to understand the importance of these relationships for learning and development.[40] The TTI suggests that positive interactions can be fostered through three broad domains of practice: emotional support (e.g., positive emotional climate and support of children's emotion), classroom organization (e.g., routines, behavior management), and instructional quality (e.g., activities used to engage children in learning and interactions).[41] Although there are few studies in LMICs that examine the effects of these relationships on children's development, research suggests that low-income children demonstrate better school readiness skills when they have a warm, caring relationship with their teachers.[42] Research has clearly shown that small classes and low teacher-child ratios are important for building positive teacher-child interactions.[43] However, pre-primary settings in LMICs tend to have much larger class sizes and ratios than is recommended.[44] As a result, it can be more challenging to implement the TTI framework in many settings. There are strategies that can be implemented in almost any setting, though, including morning greetings, calling children by their name, recognizing accomplishments, and recognizing acts of caring or kindness.

Evidence from both HICs and LMICs has clearly demonstrated the importance of play during the pre-primary years.[45] Play-based learning occurs along a continuum, ranging from children's self-directed play to direct instruction.[46] In general, play-based learning that is both child initiated and teacher supported is associated with better language, cognitive, and social competencies, increased self-regulation, and greater content knowledge across disciplines.[47] **Guided play**, in which educators create learning

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[35] Stipek & Byler, 1997

[36] Dignath, Buettner, & Langfeldt, 2008; Donohue, Perry, & Weinstein, 2003)

[37] Driscoll & Pianta, 2010; Goble & Pianta, 2017

[38] Blair & Raver, 2015; Burchinal et al., 2008; OECD, 2015, 2021; Pianta et al., 2008)

[39] Pianta, 1999

[40] Hamre et al., 2013

[41] Hamre et al., 2013

[42] Hatfield et al., 2016; Goble et al., 2016

[43] Browne et al., 2017

[44] Bartlett, 2010

[45] Dash 2019; Schlesinger et al., 2021; LEGO Foundation, 2018; Wisneski & Reifel, 2012

[46] Zosh et al., 2017

[47] Yogman et al., 2018

environments and opportunities that reflect children's interests but do not take away their ability to lead that play, is especially beneficial for school readiness because it requires children to be creative, communicate and cooperate with peers, and problem-solve.[48] For example, when students express an interest in buying or selling food at market, educators might encourage pretend play by providing non-specific props (e.g., counting chips for coins, pieces of paper for play money, beans, sticks, or other natural materials for food) that reflect the market. This requires children to use descriptive language (spoken, signs, or gestures) to make sure their peers understand what they are playing. A lesson in which teachers describe how food gets from the farm to the market might also be carried out. Similarly, when students express an interest in animals, educators might encourage children to act like their favorite animal; a lesson on animals (e.g., what they eat or how to care for and protect them) might be carried out. **Self-directed play** (also known as free play), in which there are no adult-directed outcomes, involves voluntary, flexible activities that require active engagement of the child and commonly involves pretend play.[49] Self-directed play is valuable for school readiness because it encourages independence, builds self-confidence, and can help foster an internal motivation to learn.[50] For example, during indoor free time or outdoor time, children can be encouraged to use their imagination and materials around them to engage in pretend-play (e.g., a library where one child is the librarian and other children are the customers who check out books; a house where children are different family members; a fictional character in their favorite book).

Developmentally appropriate, equitable, and inclusive practices must guide pre-primary pedagogy to provide the foundational skills all children need to succeed in school.[51] Developmentally appropriate practice (DAP) in pre-primary education recognizes the many strengths children bring to the classroom and is essential for promoting optimal learning and development across multiple domains.[52] In developmentally appropriate classrooms, children are encouraged to make choices and decisions, explore their interests, speak, sign, or gesture rather than listen, and learn through experience. For example, educators might break children into interest groups during a lesson and provide "real" objects for exploration during the lesson. Because developmentally appropriate practice must be ability-appropriate for every child, it can facilitate an equitable and inclusive classroom in which all children can learn.[53] Such equitable and inclusive pedagogy, often situated within a Universal Design for Learning (UDL) framework, provides all students with an equal opportunity to learn by presenting learning materials in a variety of ways (e.g., by seeing, hearing, and/or touching), allowing for flexibility in how learners access materials (e.g., giving children choices, having one child count or having the whole class count together), and offering a range of opportunities for learners to demonstrate mastery of that material (e.g., naming an object, pointing to an object, holding up a matching object).[54] Both DAP and UDL have been found to support positive academic and social outcomes in young children.[55] Practices that are not developmentally appropriate include presenting information to children and expecting them to passively receive (rather than actively engage with) that information, teaching children skills they are not ready to learn (e.g., reading multiple words or sentences, adding and subtracting, sitting and listening to instruction for long periods of time), failing to create a sense of belonging in the classroom that is essential for engagement, and expecting children to do tasks over and over that they have consistently struggled with (rather than providing an alternative task).

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[48] Björklund et al., 2020; Dickinson et al., 2019; Petersson & Weldemariam, 2021; Strauss & Bipath, 2020
[49] Hirsh-Pasek et al., 2009
[50] Dash, 2019
[51] Bredekamp & Copple, 1997; Carta et al., 1991; Gauvreau, Lohmann, & Hovey, 2021; Spaull, 2013; Zaw, Mizunova, & Yu, 2021
[52] NAEYC, 2020
[53] NAEYC, 2020
[54] CAST, 2018
[55] Beneke et al., 2019; Chai & Chen, 2019; Denham, 2018

ADDITIONAL CONSIDERATIONS FOR EFFECTIVE PEDAGOGY[56]

Although the focus of this brief is on pedagogical practices, it is important to consider multiple other elements of the early childhood experience that can affect the quality and implementation of pedagogical practices. For example, it may be important to consider:

- The level of **educator qualifications necessary to support early childhood development**
- The **amount of training and professional development** in pre-primary education, effective pedagogy, and/or early child development educators receive
- The **size of the school or class**, which can affect educators' ability to provide high-quality support and instruction
- The **educator/child ratio**, which can also affect educators' ability to provide high-quality instruction and reduce opportunities for positive educator-child interactions
- The level of **parent/family engagement** both in the classroom and at home with the child
- The amount of **system-level planning** that occurs and **resource allocation** that exists for pre-primary education at the local and national government level

SECTION 4:

Guidance on Effective Pre-Primary Literacy, Numeracy, and Social Emotional Learning (SEL) Instructional Strategies (Implementation Tips)

Guided by the principles described above and the existing literature in HICs and LMICs, the following section describes seven effective pre-primary practices. Each practice assumes a child-centered rather than educator-directed approach. That is, children's interests should be central to each activity, and children should be encouraged to actively engage in a dialogue around learning materials with adults and peers. Further, because pre-primary education typically serves children ages three to six who may exhibit a wide range of skills and knowledge, the implementation tips are meant to offer sample strategies across this entire age range. Similarly, in some contexts, letters and numbers are not introduced until children reach primary school, a decision typically driven by cultural norms, values, and expectations and made at the national level. As a result, some tips will be inappropriate for very young children while others will be less appropriate for older children. Educators will need to have an understanding of their students' skills and tailor the content and activities appropriately.

Each implementation tip should be adapted to the local context to reflect cultural values, learning expectations, and resource availability. Resources and instruction should be offered in a language the child uses or understands to maximize access to the content. Educators can consider accessing the Global Digital Library for free age and language appropriate books or telling oral stories—verbally, using sign language, or using gestures. When paper and writing utensils are not readily available for all children, they can practice letter or number writing on slates or in the sand or soil. Whenever possible, however, efforts

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[56] Aboud & Proulx, 2019; Thomas, 2021; USAID, 2021

should be made to overcome the obstacles presented by low resources to support school readiness for all children.[57]

Although examples have been provided for a specific school readiness skill (e.g., literacy or numeracy), a range of skills can be infused into each of these practices to support school readiness. For example, when encouraging talk, singing, signing, or gesturing, educators can consider adding dancing to the activity to foster motor development. Similarly, when engaging in everyday math activities, educators might ask children to talk about why a color (which is commonly used to identify groups or objects for pre-numeracy tasks) makes them happy or why they like a shape, thereby integrating both language and social-emotional development into a math lesson.

WHAT IS A "READER" IN PRE-PRIMARY SCHOOL?

The term "**early emergent reader**" refers to children who are just beginning to grasp pre-literacy skills such as letter recognition or basic print concepts such as "reading" a book in the appropriate direction (e.g., left to right or right to left). Early emergent readers are also beginning to develop phonological awareness skills. Large print, repetitive patterns, and lots of pictures are important components of books for early emergent readers. [58]

The term "**emergent reader**" is commonly used to describe children who have developed an understanding of the alphabet and who have good phonological awareness skills. Books with more text that cover familiar topics and rely less on repetitive patterns are beneficial for emergent readers. [59]

For both the early emergent reader and the emergent reader, pre-literacy skills should be developed in the signed, spoken, and/or tactile language that the child uses regularly and understands well.

THE ROLE OF THE HOME ENVIRONMENT

Though our focus is on effective pedagogy, it is important to acknowledge the role the home environment plays in early learning and development. Research has clearly demonstrated the role of the home environment in children's school readiness.[60] Children who experience high-quality home environments, marked by both the quality and quantity of cognitive stimulation and emotional support, demonstrate significantly better language and math competency and fewer behavior problems at school entry.[61] Moreover, although educators' capacity to teach effectively and provide safe and supportive learning environments is a strong predictor of children's school readiness, studies that also take into account the home environment have demonstrated that the home environment explains differences in children's school readiness skills above and beyond educator and classroom effects.[62]

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[57] Spier et al., 2019
[58] Learning A-Z, 2021
[59] Learning A-Z, 2021
[60] Bradley et al., 1989; Leventhal et al., 2004
[61] Foster et al., 2005; Melhuish et al., 2008; Price et al., 2013; Wolf & McCoy, 2019
[62] Connor et al., 2005; Darling-Hammond & Youngs, 2002

As such, the success of some of the practices described below may depend on the child's experiences at home, the family socioeconomic background, and the interactions the child has with caregivers. Educators may need to consider the home environment when determining which practices are most appropriate or when making decisions about how to adapt practices to meet the needs of their students.

EFFECTIVE PRACTICE 1: Create a literacy-, math-, and emotion-rich classroom environment.

Pre-primary classrooms that are literacy-, language-, math-, and emotion-rich offer children regular exposure to the basic elements of each school readiness skill.[63] Enrichment across all of these domains can be accomplished by making language, literacy, math, or social-emotional-related objects and tools readily available and accessible and by organizing activities and routines around letters, words, numbers, or emotions.

IMPLEMENTATION TIPS

Materials:

■ Materials should range from formal language, literacy, numeracy, and social-emotional curriculum materials to everyday materials like handmade labels for doors, windows, desks, etc., counting chips, and emotion words written on the chalkboard or created out of paper.

General Organization:

■ Place shapes, numbers, letters, and emotion faces/words at children's eye level.

■ Label everything.

Literacy Organization:

■ Provide a literacy center that children can access regularly and that includes age-appropriate thematic books, emotion books, high-interest picture books for diverse learners—all in multiple modes whenever possible, such as written, braille, audiobook, and sign language storybook formats.

■ Provide a corner of the classroom with context-appropriate writing materials when possible (offering a variety of writing utensils provides diverse tactile experiences and opportunities for diverse learners) where students can practice holding writing utensils, mimicking the writing process, or writing letters or numbers, and develop their fine motor skills.

■ Read aloud on a regular basis to engage learners of diverse ability.

■ When possible, consider providing a companion listening option where students can listen to books rather than look at or "read" them.

Math Organization:

■ Create a math center filled with any objects that can be used to "practice math."

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[63] Flynn, 2016

- Create numbered lists (e.g., class rules, daily schedule) displayed on paper or on chalk boards that illustrate numbering and sequencing.
- Have a clock with numbers and a calendar with days of the month to foster number recognition and to help them measure time.
- Organize objects (e.g., counting chips, bottle caps) into related groups to help children identify patterns.

Social-Emotional Organization:

- Provide a safe space in the classroom for children to go to when they need to regain control of their emotions and feelings.
- Have clear class rules posted in the classroom that educators can regularly review with children. Attaching a picture related to the rule can help pre-literate children learn the rules as well.
- Create a choice board or choice cards where children can choose one of several appropriate activities or behaviors. These are particularly useful for problem-solving because they help children learn how to make appropriate decisions.
- Incorporate age-appropriate books about emotion into literacy stations.

EFFECTIVE PRACTICE 2: Engage in shared book reading.

Shared reading typically involves the whole class and the educator reading a book that is beyond the level of the children. Initially, the educator does most of the reading, but as children become more familiar with the text, they may join in. Shared reading facilitates numerous pre-literacy skills, including basic exposure to print, fostering an interest in books or materials (especially when a child cannot read on their own), helping children understand how to use a book (e.g., how to handle it or the idea that the words go from left to right or right to left on a page), building sight word knowledge (i.e., words a child can read without sounding out the word), and reading fluency.[64] Shared reading also offers an inclusive approach to supporting struggling early emergent and emergent readers by providing support to an entire group of children, not just one or two. This activity is best accomplished using a Big Book (a book that is big enough for all children to the view the images in a large class) where available.

⊙ IMPLEMENTATION TIPS

Materials:

- Text with oversized print and illustrations.
- Whenever possible, books should be provided in the child's primary language—that is, the language they can use and understand.

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[64] Dowdall et al., 2020; Nasir et al., 2021; Piasta et al., 2012; Strasser, Vergara, & Del Rio, 2017

Approach:

- Beginning: Use the title, cover, and author/illustrator to introduce the story and important print concepts (e.g., a book has an author and sometimes an illustrator). Engage students in a discussion about what they think the story will be about.

- Middle: Read the story to the children, pausing to ask them questions to seek an understanding of their comprehension and to have them make predictions of what is going to happen next.

- Ending: Engage children in a conversation about their reactions; invite them to connect the story to their own life and share similar experiences; ask them to retell the story in their own words.

Additional activities:

- Have children act out the story as a follow-up.

- Identify letters and ask children to think of other things that start with that letter.

EFFECTIVE PRACTICE 3: Talk, Sing, and Gesture.

Expressive and receptive language and exposure to words provides an essential foundation for later literacy.[65] Children begin to make sense of words, sentences, and sounds as early as infancy, which enables them to gain essential phonological awareness and phonics skills. Not only do children need to *acquire* language from adults through talking, in signed and spoken languages, singing, and gestures, but they also need to be able to *use* language through these same strategies. Children who are exposed to a language-rich environment during early childhood significantly outperform their peers who experience language-poor environments at school entry and beyond.[66] Moreover, children with a strong vocabulary during early childhood demonstrate significantly better reading achievement later in life.[67] Teacher knowledge, respect, and support for the diversity of children's identities, families, cultures, and linguistic backgrounds are also important in early literacy development.

IMPLEMENTATION TIPS

Strategies for practicing "talk" with children:

- Model language (through words, signs, tactile experiences, or gestures).

- Talk, sign, or gesture clearly and slowly; have children talk, sign, or gesture clearly and slowly.

- Recite letters and numbers with children on a regular basis.

- Repeat words.

- Introduce new words and ask children to repeat/use those words.

- Pay attention to what children say and expand on their language, vocabulary, etc.

- Provide lots of opportunity for communication between adults and children and among children.

[65] Griffin et al., 2004; Paatsch, Scull, & Nolan, 2019; Snow, 1991
[66] Hart & Risley, 1995; Snow, Burns, & Griffin, 1998
[67] Bleses et al., 2016; Hemphill & Tivnan, 2008

- Regularly engage in song with children, particularly alphabet and number songs and songs about emotions while they are learning letters, numbers, and emotions. Add gestures and movements to ensure students understand the song.
- Ask open-ended and follow-up questions that allow children to practice their language skills.
- Gently correct mistakes by repeating statements back with appropriate words or language.
- As children develop language, offer opportunities to engage in symbolic play. Lay out a few basic classroom items and assign each of them a word or rhythm. When you touch the item, use the new word or rhythm to create a sentence or song.

Incorporating language into daily activities:

- Talk, sign, or gesture about what you are doing throughout the day (e.g., let's practice our counting; let's sit at our desks). Have children do the same thing.
- Descriptively comment on a child's activity (e.g., I see you are building a house with your blocks; I see you are drawing a circle).
- Ask children to comment on their peers' activities (e.g., what do you think your friend is doing?).
- Incorporate song into the daily routine whenever possible (e.g., at transitions, in preparation for going outside or going home) and ask children to lead the songs once they know them. Gestures linked with the songs can also be used to ensure that children understand the meaning of the song and to support motor development.
- Talk, sign, or gesture through simple activities like preparing for a lesson, cleaning up, or getting ready to go outside.
- Offer descriptive clues about an object and have children guess what you are describing (e.g., we use it to sweep the floor—a broom).
- Label pictures in a book and ask children where else they have seen the item.

EFFECTIVE PRACTICE 4: Teach children to view their world mathematically.

When students are encouraged to recognize and talk about math in everyday situations, mathematical concepts become familiar and comfortable. Mathematical learning then becomes less about rote memorization and more about children actively making sense of the world around them.[68] Children who are taught math by relating math concepts to their existing knowledge and who are asked to reflect on their own understanding are more than a year ahead of their peers who are taught math primarily through rote memorization at school entry.[69] Once children are comfortable with informal math concepts, educators can then link those informal concepts with formal math vocabulary and math symbols.[70] This early math talk is associated with later math knowledge and success.[71]

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[68] Grossman, 2012
[69] Boaler & Zoido, 2016
[70] Clements, 2004; Gallenstein, 2005
[71] Eason & Ramani, 2020; Gürgah Oğul & Aktaş Arnas, 2021; Haßler et al., 2019; Klibanoff et al., 2006

⚙ IMPLEMENTATION TIPS

Educators should use open-ended questions to encourage math conversation in everyday situations:

- What can you use (in the classroom, in the play yard, etc.) to make a pattern?
- What patterns do you see in this book?
- How might we sort the sticks (e.g., short, long; narrow, wide)?
- Which container is bigger? Smaller? Equal?
- What numbers are on this page? What do these numbers tell you?

Educators should link formal concepts with informal or everyday experiences:

- Phrases like "same as" should be linked with "equal." "More/fewer than" should be linked with unequal.
- Provide opportunities for children to recognize collections of items (e.g., pencils, blocks, bottle caps, rocks, beans, toys) that are equal or unequal.
- Use collections to add more items or take items away and then count with children to determine how many there are (or ask older children to count how many there are).
- Provide opportunities for pretend-play scenarios such as shop, where children take turns being the shopkeeper and ask for different numbers of items.

Educators should encourage children to find patterns and shapes in what they see around them:

- What kind of pattern do you see in the teacher's dress? The child's shirt?
- If the first ring is blue, the second ring is red, and the third ring is blue, what color would the next ring be?
- What shape is this rock?

Educators should help children identify things in everyday life that are measured and ask them why they need to know how they are measured:

- How cold is it outside (so we know whether we need more clothes on)?
- How much water do we need (so we can water our crops)?

EFFECTIVE PRACTICE 5: Teach the many aspects of math, not just numbers (e.g., numbers, operations, patterns, shapes, and measurement).

Ample evidence suggests that early mathematics experiences lay an essential foundation for the acquisition of more complex math skills.[72] Using a sample of U.S. children, Duncan et al. found that mathematical knowledge at school entry was the strongest predictor of later math success.[73] Others have noted similar patterns of findings.[74] Children need opportunities to experience numbers and math on a regular basis.

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[72] Jordan et al., 2009; Purpura, Baroody, & Lonigan, 2013
[73] Duncan et al., 2007
[74] Watts et al., 2014

Math concepts should be taught not just in math-focused lessons but across the curriculum. Look for opportunities to incorporate math concepts into language, art, music, science, and play.

IMPLEMENTATION TIPS

Number sense activities

- Expressive counting combined with counting with manipulatives (e.g., counting chips, bottle caps, blocks) connects verbal counting with object counting.
- Practice simple addition and subtraction using manipulatives (e.g., stones, counting chips, blocks).
- Use counting cards (i.e., cards with a number written on them) and manipulatives (e.g., counting chips, rocks, dried beans) to match numbers with quantities.
- Use a calendar to count down the days to the weekend or a special holiday.
- Have attendance charts (on paper or on the chalkboard) where the educator calls out each child's name and children help sort their peers into groups (present/absent). This can be done using actual name cards for the children or with simple hash marks in a present/absent column. Once the sorting is completed, ask children to help count both groups (identifying which group has more also facilitates measurement concepts). If there are lots of children in the class, focus on counting the absent students.
- Create patterns of physical actions like clapping, jumping, stomping, slapping. Have children repeat those patterns and eventually identify what comes next in the sequence.

Measurement activities

- Compare sizes of various items (e.g., taller or shorter, bigger or smaller).
- Use yarn, sticks, or other manipulatives to measure the length of classroom desks, chairs, or other objects; for example, how many sticks long is your desk?
- Measure the size of the door, desk, carpet, etc. by pacing it off with children's own feet; for example, how many of your feet wide is the door?
- Have children think about different animals they have encountered and have them determine which animal is bigger or smaller. When possible, bring in pictures of animals and have children use yarn to measure the animals in the picture. Ask children to tell you which one is bigger and which one is smaller or create comparisons for the children (e.g., is animal 1 bigger than animal 2?).
- Play guessing games where the educator says: "I am thinking of a number that is bigger than two but smaller than five." Then have children guess the number.
- Sort classroom objects by color, shape, or some other characteristic and then have children identify which group has more red items. Children might also be asked to indicate which shape there are more of.

Geometry activities

- Ask children to arrange blocks or colored shapes into patterns and then ask them to identify or describe their pattern.
- Have children sort materials into corresponding bins or locations at clean-up time.
- Ask children to find different shapes in picture books.

- Go on a "shape hunt" in the classroom, around the school, or outside.
- Ask children to re-create a shape you make using blocks or other manipulatives.

General math activities

- Create math art, e.g., making a calendar, making clocks using natural materials like stones and sticks, making counting cards, or creating shapes from materials in the classroom or the play yard.

EFFECTIVE PRACTICE 6: Create a community of caring.

Children are not born with emotion knowledge. They must learn what emotions are, how to recognize emotions, and what the causes and consequences of emotions are. Research clearly demonstrates links between emotion knowledge and other school readiness domains, including literacy,[75] math,[76] and social-emotional competencies.[77] Talking about and modeling emotions teaches children how to identify emotions, encourages conversation around emotions, and helps children begin to understand both internal and external factors that cause emotions. Importantly, children who understand caring and kind behaviors and who are respectful of others can engage in positive play with their peers and supportive interactions with adults. Establishing predictable routines, transition strategies, and developmentally appropriate behavioral expectations can also help facilitate a caring classroom environment because children know what to expect and when to expect it; there are no surprises during the day. Children who are part of a caring classroom community feel safe and secure, essential foundations for learning.

IMPLEMENTATION TIPS

Labeling their own and others' emotions

- Start the day with a check-in. Ask children to describe how they are feeling or have the children find another child in the classroom and ask that child how they are feeling.
- Pick an emotion and ask children to talk about a time when they felt that emotion.
- Use books to help children begin to understand how others might feel. Ask them to describe how a character in the book might feel. Follow up by asking them to think about how they would feel in the same situation.

Showing empathy, kindness, and self-control

- Have children think about ways they can help others feel better. Educators might begin by asking how children can know what someone else is feeling and then follow up by asking how they can help that person feel better. Once children understand empathy for other people, consider extending the activity to empathy with other things like animals, trees, and crops.
- Hold class discussions in which you ask children to talk about what kindness means. Ask children to describe what acting kind looks like. Ask them to describe kind words. Ask them to talk about what kindness feels like.

[75] Wolf & McCoy, 2019
[76] Cavadini et al., 2021
[77] Lucas-Molina et al., 2020

- Ask children what they think it means to care about someone. Share a definition of what it means to care about someone (e.g., when you care about someone you are not rough but gentle; or when you care about someone you want to know how that person is feeling). Then ask children to share a time when they cared about someone or when they felt cared for. Talk about other ways children and adults can show they care.

- Make acts of empathy and kindness public. Educators should be intentional about noticing and recognizing acts of empathy and kindness. Celebrate these acts with the rest of the class.

- Engage in physical activities and games to help children develop and practice self-control. For example, have children play in-country versions of games such as "Simon Says" or "Red light, green light" to help them inhibit impulsive behavior and foster more positive peer interactions.

- Engage in games with rules (e.g., hide and seek, chasing games, or throwing and catching) to help children manage behavior and emotion and understand sequencing and instructions.

EFFECTIVE PRACTICE 7: Build positive relationships in the classroom.

A supportive classroom environment, marked by caring and responsive teacher-child and peer relationships, provides children with the safe, supportive learning environment they need for positive development. Evidence from both HICs and LMICs highlights the critical role positive relationships play in healthy development.[78] For example, positive teacher-child relationships can reduce the frequency and severity of behavior problems, help children develop positive self-esteem, and improve rates of engagement in learning.[79] Daily interactions between teachers and children have even been thought to drive learning.[80]

IMPLEMENTATION TIPS

Building adult-child relationships

- Each morning, meet children at the door and offer them the choice of a culturally appropriate greeting such as a hand shake, high five, fist pump, hug, or nothing if they choose. This creates a connection with the children but also values their choice.

- Throughout the day (or over several days if the class is large), visit with each child in the classroom and ask them to tell you about themselves (e.g., how many brothers and sisters they have, what they like to do, what they like to eat).

- Set clear expectations for children around classroom behavior and schoolwork and explain those expectations to children so they understand what is expected of them at school. Remind children of those expectations as needed and redirect children when they engage in unwanted behavior.

- Follow the children's lead and interest during play. Get on the child's level when interacting with them.

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[78] Meloy & Schachner, 2019; OECD, 2021; Thompson & Raikes, 2007; Wolf et al., 2018
[79] Birch & Ladd, 1998; Levya et al., 2015; Pianta et al., 1995
[80] Hamre & Pianta, 2007

- Use a calm voice when talking with children, make eye contact, and provide warm, responsive physical contact when culturally appropriate and comfortable for children.

Building relationships among children

- Ask children to bring an object from home and have them tell their classmates about the object (e.g., what is it, why they like it). This allows children to get to know one another and provides the educator with another opportunity to connect with children.

- Go around the room and have children describe one good thing in their life or something good that has happened to them. If the class is large, select a few children each day.

- During activities, make sure children have an opportunity to work together, take turns, share, and help one another.

- Encourage children to listen to each other.

SECTION 5:
Additional Research Needs

While there is overwhelming evidence in support of the pre-primary pedagogical principles and practices discussed in this brief, the evidence coming from outside of HICs remains limited. Studies conducted in LMICs would be beneficial to reinforce and refine practice recommendations in that context.

Specifically, areas that would benefit from further research in LMICs include:

- Rigorous research evaluating adaptations of the effective practices identified in this brief to a range of diverse LMIC contexts
- Evaluations of the efficacy of these practices in diverse contexts, and in inclusive classrooms
- Strategies to implement the TTI framework in settings where class size or ratio are large
- Criteria for selection of pre-primary school-based activities with consideration for home life factors
- SEL practices designed for different cultural contexts

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Contact

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