Embedding Motor Activities Into Inclusive Preschools

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Stephanie, a half-day preschool teacher, observes that Tiffany, a happy albeit shy child, often plays alone during outdoor time. While Tiffany has strong verbal abilities, Stephanie notes that her use of a walker for mobility limits her socialization and independent play on the slide, trikes, or climbing structures. During circle time and motor activities, Stephanie also keeps an eye on Max, a child with autism. Max enjoys active motor play and playing with race cars but often has difficulty imitating actions, following directions, and balancing. He benefits from visual supports to stay focused and engaged. Both Tiffany's and Max's parents have expressed concerns about their children's school readiness skills including their gross motor competence. Although Stephanie understands that gross motor development provides a foundation for other developmental domains (e.g., social, communication, and cognitive), she does not know how to create enough engaging opportunities for children with and without disabilities to work on these skills within the brief 2½-hr time period that her students are with her each day.

The early years (birth to age 5) in children's lives are a crucial time of growth and physical development. Infants learn how to lift and turn their head, sit up, and crawl by using their large muscles within the first year of life. Gross motor skills continue to develop in the second, third, and fourth years of life as young children navigate their environment by pulling up to stand, cruising around furniture, walking, and ultimately running. Through play and physical activities (PAs), children have many opportunities to develop gross motor skills that require the use of large muscles for movement and control. Young children use gross motor skills as they engage in daily tasks such as sitting upright, maintaining control and balance while seated, walking down the hallway, moving forward and backward using a variety of locomotion strategies (i.e., tiptoe, gallop, and march), and manipulating objects (i.e., playing with balls, and carrying books and backpacks). As 3-, 4-, and 5-year-olds, children develop even more sophisticated skills such as kicking, climbing, and jumping. The acquisition of motor skills is cumulative and sequential, and depends on multiple opportunities for PA (Clark, 2005).

The National Association for Sport and Physical Education (NASPE; 2002, 2010) recommends that preschoolers engage in at least 120 min of structured and unstructured PAs each day, recognizing that motor development occurs when children are

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provided with multiple opportunities for PA. These recommendations are consistent with the Division for Early Childhood of the Council for Exceptional Children's (DEC; 2014) Recommended Practices that emphasize the need for practitioners to provide ample opportunities to maintain or improve young children's health-related fitness and development.

The development of competence in gross motor and early fine motor skills has been demonstrated to have an impact on later motor skills as well as other domains of development (i.e., social, language, and cognitive; Favazza & Siperstein, 2016). For example, consider all of the social, communication, and cognitive skills a child can master as he rides a tricycle along a path with a peer, negotiating obstacles that present themselves while chatting about the birds, squirrels, and butterflies visible around the playgrounds. Young children with disabilities, however, may experience delays in motor abilities (Emck, Bosscher, Beek, & Doreleijers, 2009), and may have fewer opportunities to participate in PAs compared with their typically developing peers (Carlon, Shields, Dodd, & Taylor, 2013). Thus, given the impact of motor skills on other areas of development, and the need to ensure that young children engage in high levels of PA, it is critical that teachers consider ways to intentionally embed opportunities to engage in and practice motor skills into the preschool day for all young children and particularly for those who may be experiencing delays.

How Can Teachers Support Gross Motor Skills?

Preschool teachers play an important role in supporting children's participation in PAs and motor development during the school day (Brown, Googe, McIver, & Rathel, 2009; Trost, Fees, & Dzewaltowki, 2008). However, early childhood educators, just like Stephanie in our opening vignette, may not know how to plan for gross motor opportunities during the preschool day which are appropriate to the activity context and occur with enough frequency to support children's gross motor skill development. Thus, our purpose is to provide early education practitioners with strategies for creating more opportunities for children to engage in gross motor activities within their already busy preschool day. Specifically, we describe strategies for creating brief gross motor opportunities by inserting physical activity breaks throughout the day and enhancing the gross motor opportunities inherent in regularly occurring transitions. First, however, we briefly address the important topic of promoting children's access to and participation in learning experiences, including gross motor activities, through the use of universal design for learning (UDL) and differentiation (Horn, Palmer, Butera, & Lieber, 2016).

Promoting Access and Participation

Before beginning any programming within preschool classrooms, including gross motor development, practitioners need to

consider how to design the learning environment to ensure that all young children including those with developmental delays and disabilities are able to access, participate, and make meaningful progress (DEC, 2014). In this context, access and participation refer to being an active part of regular activities and routines in the natural environment or, said another way, the environment in which the children spend their time (DEC, 2007). Providing instructional support within a multitiered model of support, the two primary strategies used to address access and participation are UDL and differentiation (Horn et al., 2016). Specifically, UDL has teachers designing learning environments from the beginning to support the widest diversity of learners. Then having accomplished this "step," the educator moves to differentiation to maximize individual children's active participation and learning within the curricular activities.

UDL

In creating a universally designed learning environment, teachers are guided by UDL principles to ensure that all learning opportunities and environments are available for every child. That is, all children are offered a variety of ways to have access to and process the content, acquire new skills, and demonstrate learning.

UDL includes three principles: *multiple means of representation* (i.e., instruction and learning activities include various formats and differences in task complexity and/or expectations in response to different ability levels), *multiple means of engagement* (i.e., employing a variety of ways to obtain and maintain children's attention and motivate them given differences in learning styles, interests, and preferences), and *multiple means of expression* (i.e., allowing a variety of response modes for children to demonstrate their knowledge or skills in response to different ability levels) (CAST, 2010; Horn et al., 2016; Orkwis, 2003).

For example, during a large group gross motor activity, *Stephanie plans to simultaneously model bowling movements while giving verbal directions to her students (multiple means of representation). In addition, to spark and maintain interest, Stephanie has taught her students to give "gentle high fives" to one another each time they go down the slide (multiple means of engagement). As Stephanie keeps a watchful eye on children as they play on the slide, she provides specific constructive feedback on each child's motor performance by saying things such as "Wow, I like the way you straighten your legs to move your body up the stairs" or "You are getting there, two more steps to the top of the slide!" to sustain children's effort and interest (multiple means of engagement). Finally, at the end of motor play, Stephanie asks children to reflect on their motor play by having each child tell or show her what they liked best (multiple means of expression).*

Differentiation

After ensuring that all children have access to motor learning

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opportunities, teachers can begin to address individual learning needs. When selecting or planning activities for preschoolers, it is important to remember that children are unique and that they have different abilities and interests. Children can be motivated by creating or adapting an activity to match their interests, or by building upon previous learning experiences. This point is especially important when considering children with disabilities, who may be more likely to develop skills in modified environments and with adapted materials (Horn et al., 2016). For example, to ensure that children are fully engaged in motor activities, teachers can modify the *learning environment* (e.g., change the size, weight, texture, or color of objects such as balls or beanbags; highlight the boundaries; or designate a space to use), *content* (e.g., break down the activities; integrate a child's favorite song or object into a motor activity such as musical chairs or an obstacle course), and *process* (e.g., use different types of prompts such as visual, gestural, or signs).

Considering that Max is very active and has difficulty following direction, Stephanie uses visual supports to help Max identify the play area for a bowling game. At the same time, Stephanie attaches a small bucket of race cars to the railing at the top of the slide (i.e., use of child preference). While all of her students enjoy sending cars down the slide, this strategy is particularly appealing to Max, who sometimes carries a car with him down the slide or pushes a car down before he descends to retrieve it. For some children, Stephanie provides invisible supports, such as standing nearby as they go up or down the slide, while for other children like Max, she gradually decreases physical support as his balancing skills improve. Table 1 provides additional examples of differentiation strategies developed for Tiffany and Max.

Creating Brief Motor Activities

Children's learning, including the development of gross motor skills, can occur anywhere and at any time throughout the day. Thus, practice opportunities need not be limited to scheduled play times such as gym and recess. Teachers can intentionally take motor breaks throughout the day and use frequently occurring transitions as motor opportunities.

PA breaks

One strategy for embedding motor opportunities into the preschool day is to integrate PA breaks whereby children engage in brief motor activities (10 min) before returning to an ongoing lesson (Wadsworth, Robinson, Becjham, & Webster, 2012). Wadsworth and his colleagues suggest that teachers lead PA breaks at least twice a day and divide each PA break into three components: warm-up (2 min), PA (6 min), and cool-down (2 min), all with children standing an arm's length away from one another.

Just as with any activity, PA breaks need to be carefully planned to support all children. Thus, in planning, educators should consider that some children may experience challenges during PA breaks if they do not know what to expect, have difficulty shifting from an active to a calm state, or, like Max, generally have difficulty changing from one activity to the next. Several strategies can be employed such as incorporating visual cues (e.g., photographs), or verbal warnings ("1-minute left") before a PA break

Table 1
Differentiated Ideas for Max and Tiffany

	Characteristics	Differentiated ideas
Tiffany	Happy disposition, easily motivated with praise/ prompts, high verbal abilities Shy, frequently engaged in solitary play Gross motor delays present challenges with independent play on climbing structures and trikes	Provide verbal directions paired with gestures (adult support) Introduce verbal cues: toss, target, high fives using cue cards (material adaptation) Have a peer demonstrate "gentle high fives" as they toss the beanbag (peer support) Divide class in half with half going to slide and other half to beanbag toss ensuring that Tiffany is in beanbag toss (invisible support) With group of peers review high fives and phrases such as "*Great toss!*" or cheers "*Go Tiffany, Go!*" allowing Tiffany to use peer responses as model (peer support) Ask Tiffany what color beanbag she would like; who she would like to be in "line next to" (child preference)
Max	Enjoys active motor play and cars Easily follows visual supports Experiences challenges with balance, following directions, transitions	Model directions paired with visual cue cards (simplification) Provide picture cards (visual support) for verbal cues: climb, car, slide, high fives (material adaptation) Use colored nylon rope to provide visual cues of boundaries for motor play area (environmental adaptation) Use picture cards to break down activities into smaller steps (simplification) Use a visual schedule to remind Max what will happen next (material adaptation) Attach picture cards at the bottom of the stairs to illustrate sequence: climb, cars, slide, high five (material adaptation) Attach a bucket of cars to the top of the slide that he gets to have go down the slide with him (child preference)

begins or ends for this can minimize children's challenging behaviors. Other children may experience difficulties during PA breaks related to their developmental delay or specific disability. For example, children with motor delays might become frustrated if they only have a short amount of time to do the motor task, a child with a visual impairment might have a difficult time following the visual cues, and children with hearing impairments might not be able to hear a 1-min auditory warning signal. Thus, teachers need to consider applying UDL and differentiation strategies before designing and implementing PA breaks. Answering the following questions can be useful in the planning process: (a) What are the concerns? (b) Why do challenging behaviors occur? and (c) How can I address the concerns and prevent problems? (Hemmeter, Ostrosky, Artman, & Kinder, 2008). After careful planning of the physical breaks to ensure adherence to universal design strategies and addressing individual child modification needs through

differentiation, teachers then evaluate implementation effectiveness by monitoring children's progress and outcomes.

Returning to our opening vignette, we illustrate how Stephanie planned for and implemented physical breaks. *Stephanie includes PA breaks 2 to 3 times a day in her classroom schedule. She notices that all the children love these brief motor breaks. She does notice, however, that Max has difficulty when it is time to move from the PA to the next activity (e.g., he cries, wrings his hands). Stephanie thinks the reason for these behaviors is that Max is really enjoying the motor activity and does not want them to end. To address these concerns, Stephanie makes a modification in the form of a visual schedule and additional adult support to prepare him for the transition, before ending the PA breaks. Moments before the PA ends, she gives him one last opportunity to do the motor activity (jump over a hurdle, go down the slide, etc.) and then provides praise as he moves to the next activity. After a week, Stephanie notices the frequency of Max's problem behaviors decreases and shares the good news with his parents who are pleased to try a similar approach for transitions at home.*

Maximizing transitions

Transitions occur often in early childhood settings as preschoolers move from one activity to another or from one room to another throughout the day. This re-occurring routine provides a natural place to embed motor movements (e.g., swing arms, skip, hop) as children transition to and from the bus, auditorium, library, music class, and restroom. Again, in planning for embedding motor movement opportunities into transition, both universal design and differentiation strategies can be used to enhance participation for all children and to address specific children's needs. For example, a variety of modes of communication can be used to announce transition times, such as singing a brief song, ringing a bell, flicking the lights, or giving a 1-min warning thus providing all children access through multiple means of representation. Multiple means of engagement strategy could include having different roles for children such as assisting in clean up, and designating a line leader, line caboose, or lead singer. Multiple means of expression could involve asking each child to demonstrate one motor movement or complete different numbers of repetitions of the motor behavior and/or completing the motor movement with different levels of proficiency.

Stephanie tried using multiple kinds of movement (i.e., walk forward, march, walk backward, side step, and take giant or small steps) throughout each of the more lengthy out-of-class transitions. She found that all of the children paid close attention (and giggled) when the movement changed using a bell signal paired with visual support cards and verbal announcements (multiple means of representation). She thought to herself, "What fun for me and my students!"

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Embedding Gross Motor Opportunities Across the Curriculum

Integrating gross motor activities into all aspects of the curriculum, such as during regularly scheduled literacy, numeracy, or science

activities or planned motor lessons (Favazza & Ostrosky, 2015), is a great way to improve motor skill outcomes and impact other areas of development (Mavilidi, Okely, Chandler, Cliff, & Paas, 2015). To get children moving across the daily curriculum, teachers can consider the following ideas described under each content area.

Literacy

Storybook reading is a common way to support young children's emergent literacy skills. Using interactive movement books is one strategy to link literacy to motor skills, and develop school readiness skills (Ostrosky, Favazza, Yang, McLaughlin, & Stalega, 2018). For instance, as Stephanie reads the book *Going on a Bear Hunt* to her class, she had the children demonstrate all of the movements, as each one emerged.

Numeracy

Integrating gross motor skills into the numeracy aspects of a curriculum can be a fun way to conduct mathematical explorations and develop mathematical knowledge (Beck et al., 2016). For example, to simultaneously address number recognition and create an opportunity for gross motor skill practice, the following game could be implemented. The children stand in a circle with a bucket in the center, and each child is prompted to look at their numbered beanbags, and when the teacher calls a number, children with that number toss their bag into the bucket. The teacher might add high fives and cheers as a way to include social and language elements. Another example is to have children toss their beanbags in the air and count as they catch them. Children also can be paired and then toss the beanbags to a partner while counting.

Science

Inquisitive preschoolers are often curious about the world and wonder how the world works. Therefore, this is an ideal time to introduce science concepts and it is an easy topic in which to embed a gross motor opportunity. For example, when talking about a unit on the weather, Stephanie had all of her students make paper plate art by cutting and pasting pictures that represented three kinds of weather: rain, sun, and snow. When she brought them together to do a science lesson, the children brought their paper plates to respond to questions such as *What is the weather like today?* When prompted, students demonstrated weather-related activities with their bodies or held up their paper plates. For example, when asked *What is the weather like when we go ice skating?* children showed their snow card. Stephanie then responded, *Great, let's all pretend to glide on the ice!* Next Stephanie asked, *What is the weather like when we go swimming at the beach?* and children held up their sun cards. She replied, *Excellent, let's all pretend to swim!* Finally, Stephanie replied, *Oh no! When we woke up this morning, we saw puddles of water! What is that from? Let's go jumping over the puddles!*

Motor activities with embedded curricular content

In addition to embedding gross motor skills practice into content activities, teachers also can use gross motor activities or games to embed important curricular content. For example, during the game Red Light, Green Light, children can not only

Table 2
Motor Activities With Embedded Curricular Content

Activity	Description	Student challenges	Differentiation strategies
Red Light, Green Light	The stoplight (teacher/leader) stands at one end of open area, students stand at the other. The leader calls a signal and movement (*Green light—jump!*). Students jump toward leader until leader says *Red Light-Stop*!	Mobility	Instead of moving toward the leader, student can just stop moving (freeze) or his or her starting line can be closer to the leader
		Vision	Do the activity with partners so one peer can guide the other
	Variations:		
	Add "yellow light" for slow.	Hearing	Use visual supports (colored paper, symbols)
	Add other movements (walk backward, swim, crawl, leap).	Dual Language Learners	Make announcements using English and home language along with visual supports
	Have students take turns being the leader		
Skills Addressed	Color recognition, motor movements, basic concepts (fast/slow, go/stop, forward/backward)		
Balloon toss	Toss balloons back and forth, standing at varying distances to make it easy/difficult.	Mobility	Underinflate balloon so it slows down the movement and is easier to grasp.
	Toss own balloon, catching with different body parts (hands, elbows, heads), counting each time student touches balloon before it falls to the ground		Using a string or tie the balloon to an anchor so it does not float away too far.
			Use a large ball instead of a balloon, or make the balloon larger than the rest.
		Hearing	Use visual supports to announce which body part to use.
		Social-Emotional	Each child plays with their own balloon first before moving to partners.
			Partners child with adult or offer invisible support (proximity to peer dyad).
Skills addressed	Body awareness, visual tracking, eye-hand coordination, counting		
Obstacle course	Create a series of lines on floor using tape. Lines can be straight, zig-zag, diagonal, etc.	Mobility	Walk the lines with additional support or a partner, do not need to do the additional actions.
	Have the students move like a rabbit, mouse, duck, horse, crab, horse, and kangaroo.	Vision	Walk the lines with a partner. Make the lines wider, textured or colorful so they are easier to see or feel.
	Variation:		
	Balance beanbag on head while walking, side stepping.	Attention	Use visual supports to indicate when and where to go.
Skills addressed	Literacy, concepts		
Tunnel Crawling	Create a tunnel using the cardboard box and tape (short, long, straight, curved) depending on number of boxes. Have the students crawl through the tunnel, using different ways/speeds.	Mobility	Go into tunnel on their own so they have more room to maneuver, do not need to do the additional actions or speeds.
		Attention and following directions	Place visuals in the tunnel to show which way to go, use visuals to show what actions to do.
	Variation:		
	Each child wears a flashlight hat to explore the tunnel	Vision	Place auditory signal (bell, beanbag with sound source) or tactile features (ribbons hanging down) at the beginning, middle, and end of tunnel to support spatial orientation.
Skills addressed	Link to science concepts (e.g., crawling caves, different crawling animals)		

work on gross motor skills such as running and skipping but they can also focus on concepts such as slow/fast and forward/backward and other types of movement (see Table 2).

Conclusion

Increasing numbers of children with disabilities, many of who have motor delays, are enrolled in inclusive classrooms. Therefore, teachers and parents need to find times throughout the day to integrate gross motor activities, recognizing that children need multiple opportunities to engage in PA to develop gross motor skills. And, while gross motor activities may not be a common feature in a preschool teacher's lesson plans, gross motor development can be thoughtfully added when a teacher is equipped with basic knowledge about gross motor play, creates a safe accessible learning environment, and undertakes a little preplanning to embed gross motor activities into the daily schedule.

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