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Katrina A. Hovey
Western Oregon University, College of Education

Ariane N. Gauvreau
University of Washington, College of Education

Marla J. Lohmann
Colorado Christian University, College of Adult & Graduate Studies

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Providing Multiple Means of Action and Expression in the Early Childhood Classroom Through a Universal Design for Learning Framework

Katrina A. Hovey[1], Ariane N. Gauvreau[2], and Marla J. Lohmann[3]
[1]Western Oregon University, College of Education
[2]University of Washington, College of Education
[3]Colorado Christian University, College of Adult & Graduate Studies

In order to ensure the success of all children in an inclusive preschool classroom, teachers must utilize evidence-based practices as outlined by the National Association for the Education of Young Children's Developmentally Appropriate Practices and the Council for Exceptional Children's Division of Early Childhood Recommended Practices. This can be achieved through the implementation of the Universal Design for Learning (UDL) framework. UDL is a proactive approach to classroom instruction that provides multiple means of engagement, representation, and action and expression. This article provides a brief overview of UDL, with a specific focus on multiple means of action and expression in the early childhood classroom. It is critical for practitioners to incorporate strategies related to multiple means of action, engagement, expression, and representation because these strategies afford all learners diverse ways to navigate the learning environment, express their understanding, and demonstrate new knowledge and skills.

Keywords: early childhood, evidence-based instruction, preschool, Universal Design for Learning, action and expression

Teachers in inclusive early childhood classrooms are guided by the best practices in early childhood education, as outlined in the National Association for the Education of Young Children's Developmentally Appropriate Practices (DAP; NAEYC, 2009) and the Council for Exceptional Children's (CEC) Division of Early Childhood (DEC) Recommended Practices (DEC, 2014). The implementation of these practices can be achieved through the use of a Universal Design for Learning (UDL) framework. UDL is a framework for creating *expert learners* by being proactive, flexible, intentional, and reflective in instructional planning and teaching (CAST, 2018; Hitchcock et al., 2002; Rose et al., 2010; Rose & Strangman, 2007).

In early childhood settings, almost 80% of children with disabilities are included in the early childhood classroom for at least some portion of the school (Lawrence et al., 2016). With this in mind, all preschool teachers must be prepared for supporting the needs of young children, including those with disabilities, in their classrooms. Furthermore, NAEYC and DEC's joint mission statement on inclusion (DEC/NAEYC, 2009) specifically notes the use of UDL to ensure optimal student learning. UDL involves instructional practices in three areas: (a) multiple means of engagement, which involves student motivation and engagement in the learning, (b) multiple means of representation, which focuses on the use of various teaching practices, and (c) multiple means of action and expression for children to demonstrate their mastery of the learning content (CAST, 2018). The current literature indicates that the use of UDL leads to both academic and social gains for young children (Chai & Chen, 2019). Through the use of the UDL framework, early childhood teachers can ensure that they are meeting the needs of all learners in the classroom, including those with disabilities.

In our previous articles (Gauvreau et al., 2019; Lohmann et al., 2018), we shared strategies for using the UDL framework to provide multiple means of engagement and multiple means of representation in the early childhood classroom. In this article, we further expand on the use of UDL in preschool by presenting strategies for offering multiple means of action and expression to young children. Incorporating diverse strategies that offer learners multiple ways to navigate the learning environment and demonstrate their learning is critical. In addition, providing learners with multiple means of engagement, action and expression helps teachers assess student progress and mastery of goals and objectives. Using a variety of formative and

summative assessments affords children opportunities to demonstrate understanding and show their learning. Assessment in inclusive early childhood classrooms is especially important because assessment allows teachers to identify student knowledge and skills, target strengths and needs, evaluate progress and growth, and adjust instruction (Wiggins & McTighe, 2005). Specifically, we recommend: (a) technology tools, (b) visual representations, (c) offering choice, and (d) hands-on learning activities. The use of UDL for instruction in the preschool classroom is supported by both the CEC Division for Early Childhood (DEC) Recommended Practices and the National Association for Young Children (NAEYC) Developmentally Appropriate Practice (DAP). DEC specifically mentions the use of UDL in Recommended Practice E2: Practitioners consider Universal Design for Learning principles to create accessible environments. In addition to this specific mention of UDL, several other DEC Recommended Practices, as well as some of NAEYC's DAP Guidelines, align with the use of the four strategies we recommend for assessment within a UDL framework. Table 1 outlines the alignment of these strategies with both NAEYC's DAP and the DEC Recommended Practices.

Table 1

Action & Expression in Preschool & Alignment with DEC Practices and NAEYC Guidelines

Action & Expression Strategy	Aligned DEC Recommended Practices	Aligned NAEYC DAP Guidelines
Technology Tools	A3. Practitioners use assessment materials and strategies that are appropriate for the child's age and level of development and accommodate the child's sensory, physical, communication, cultural, linguistic, social, and emotional characteristics. A7. Practitioners obtain information about the child's skills in daily activities, routines, and environments such as home, center, and community.	4D. The methods of assessment are appropriate to the developmental status and experiences of young children, and they recognize individual variation in learners and allow children to demonstrate their competence in different ways. Methods appropriate to the classroom assessment of young children, therefore, include results of teachers' observations of children's work samples, and their performance on authentic activities.

Visual Representations	A3. Practitioners use assessment materials and strategies that are appropriate for the child's age and level of development and accommodate the child's sensory, physical, communication, cultural, linguistic, social, and emotional characteristics. INS4. Practitioners plan for and provide the level of support, accommodations, and adaptations needed for the child to access, participate, and learn within and across activities and routines. INS11. Practitioners provide instructional support for young children with disabilities who are dual language learners to assist them in learning English and in continuing to develop skills through the use of their home language. INS12. Practitioners use and adapt specific instructional strategies that are effective for dual language learners when teaching English to children with disabilities.	4D. The methods of assessment are appropriate to the developmental status and experiences of young children, and they recognize individual variation in learners and allow children to demonstrate their competence in different ways. Methods appropriate to the classroom assessment of young children, therefore, include results of teachers' observations of children's work samples, and their performance on authentic activities.
Offering Choice	A3. Practitioners use assessment materials and strategies that are appropriate for the child's age and level of development and accommodate the child's sensory, physical, communication, cultural, linguistic, social, and emotional characteristics. INS1. Practitioners, with the family, identify each child's strengths, preferences, and interests to engage the child in	2E2. Teachers present children with opportunities to make meaningful choices, especially in child-choice activity periods. They assist and guide children who are not yet able to enjoy and make good use of such periods. 2F1. To help children develop initiative, teachers encourage them to choose and plan their own learning activities.

	active learning.	
Hands-on Learning	A3. Practitioners use assessment materials and strategies that are appropriate for the child's age and level of development and accommodate the child's sensory, physical, communication, cultural, linguistic, social, and emotional characteristics. A7. Practitioners obtain information about the child's skills in daily activities, routines, and environments such as home, center, and community. E6. Practitioners create environments that provide opportunities for movement and regular physical activity to maintain or improve fitness, wellness, and development across domains.	2E1. Teachers arrange firsthand, meaningful experiences that are intellectually and creatively stimulating, invite exploration and investigation, and engage children's active, sustained involvement. They do this by providing a rich variety of materials, challenges, and ideas that are worthy of children's attention.

(Division for Early Childhood, 2014; National Association for the Education of Young Children, 2009)

Technology Tools

Over the past several weeks, Ms. Maria has been teaching her class of prekindergarten children about animal habitats. They have studied terms including "desert," "forest," and "tundra." In addition, the class has learned about animals that live in each habitat. Throughout the learning unit, the class has been using flashcards and animal figurines to sort animals by their habitats and each child has built a 3-D model of their favorite habit using playdough and photographs of animals. To support the learning of students with visual impairments, Ms. Maria offers flashcards with large images. As they approach the end of the unit, Ms. Maria wants to design an assessment to understand each child's mastery of the learning material. In order to do this, she designs a sorting game (Figure 1) using the TinyTap (TinyTap Ltd., 2019) app on the classroom iPad. When it is time to assess the children's learning, each child gets a turn to play

the game. Ms. Maria uses the analytics tool within the app to understand each child's mastery of the content.

Figure 1.

Sample Sorting Game

When used with teacher guidance and support, the use of technology tools can support the learning of young children and to assess their mastery of concepts (Gimbert & Cristol, 2004). For young children with disabilities, the use of touch-screen technologies, such as tablets, smart phones, or other handheld mobile technologies, iPads, can aid in accessing learning content that may be inaccessible in traditional formats (Chmiliar, 2017). Similarly, for younger children, tablets may be a good option due to their size and ease of use (Varier et al., 2017). In addition, the use of technology in the preschool classroom increases language and communication skills, improves social interactions (Hutinger & Johanson, 2000), and provides opportunities to engage in back-and-forth communication with parents (Gauvreau & Sandall, 2017). For young children with language-based disabilities, such as autism spectrum disorder or speech impairments, the use of technology-based communication systems in the form of augmentative and alternative communication (AAC) also increases literacy skill development and provides young children with an avenue for communicating their learning (Light et al., 2019).

Like Ms. Maria, preschool teachers can use technology tools to evaluate children's learning in their classrooms. Technology tools, such as iPads, may be used to adapt traditional paper-pencil assessments for young children (Wiseman et al., 2017), as discussed in the previous vignette. However, teachers should be aware that technology tools may not be a reliable form of assessment for children under the age of four and in some cases, teacher-directed assessments may be more effective in gauging children's knowledge (Wiseman et al., 2017). When choosing to use technology as a form of assessment, teachers must ensure that it is appropriate for the children in the preschool classroom.

When evaluating potential technologies to use in the preschool classroom, Aronin and Floyd (2013) recommend that teachers look for programs that (a) require the child to make actions occur within the game/app, (b) include a cause/effect component, (c) include a result from the child's actions in the game that are clearly visible to the child, and (d) include immediate responses when children act in the game. A few apps that align with these recommendations include: AlphaTots, Artie's World, Elmo Loves ABCs, Khan Academy Kids, Peg + Cat: The Tree Problem, and Highlights Monster Day (Appcessible, 2022). In addition, it is critical that teachers ensure any technology tools used enhances learning (Gimbert & Cristol, 2004), rather than be used as simply a fun toy or reinforcer. Technology should never be used just for the purpose of using technology but should instead be used as a purposeful instructional tool. In addition to its use for learning, technology can also be used as a screening tool to identify health concerns, such as hearing and vision, that may impact learning (Eksteen et al., 2019).

Visual Representations

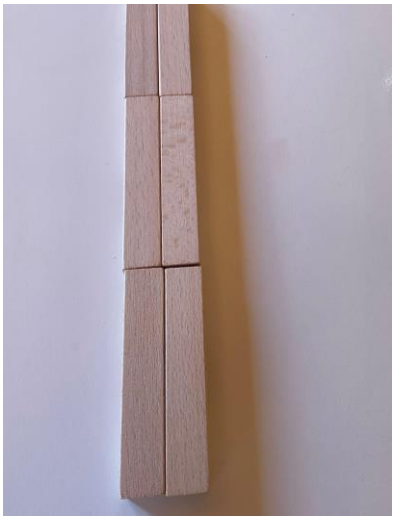
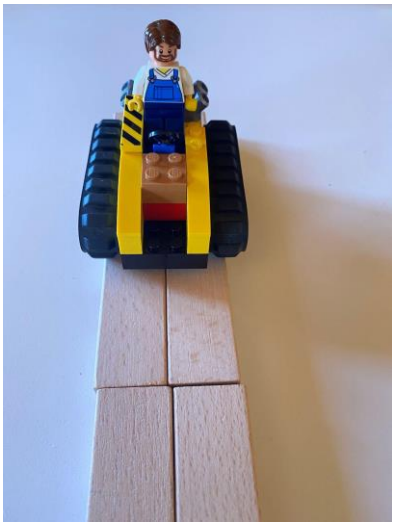
The preschoolers in Ms. Holly and Mr. Steve's inclusive classroom are an energetic and active group of learners. Free choice is an especially busy time of the day. The preschoolers love the block area, and many children are happy to spend all of free choice time creating things with wooden blocks, figures, cars, and train tracks. While many children are deeply engaged during free play, teachers notice that some children seem to have trouble engaging with materials and tend to wander around the room aimlessly. Others have difficulty initiating play and then remaining with a toy or an activity for more than a few minutes. In order to better support

children with these executive functioning skills difficulties(?), the teachers consider UDL and providing multiple means of action and expression using visuals. Ms. Holly creates three-step play scripts, depicting things to do in the block area (e.g., build a road, drive a car, pick up a passenger; shown below), visuals with ideas of things children can build (e.g., photos of buildings in the community and different types of homes), and a first/then visual depicting a symbol for cleaning up and a symbol for snack, the activity after free play. The teachers teach the children how to use these visuals during circle time, explaining what each symbol and picture mean, and invite children to come and demonstrate how to use these visuals for their friends. After a week, Ms. Holly and Mr. Steve observe the children using the visuals and engaging in more independent play, remaining safe in the block area, and see children transitioning to snack time with very little teacher support.

Visual representations are a common evidence-based practice used to teach new skills and support communication (Hovey et al., 2019; Odom et al., 2003). For young children with disabilities such as autism, visuals can be an unobtrusive, effective way to help a child focus on the specific message in a direction, reduce anxiety, provide prompting, make abstract concepts more concrete, and help the child express their wants and needs (Rao & Gagie, 2004). These supports can take many forms, including, but not limited to schedules, prompts, communication aides, and play reminders. Visual representations can and have been used to teach a wide variety of skills across populations, to teach academic concepts, support behavior, and promote adaptive skills (Demmetter et al., 2000; Gauvreau, 2017; Gauvreau & Schwartz, 2013; Meadan et al., 2011; Rao & Gagie, 2004). When considering UDL and providing multiple means of action and expression, visuals can promote executive functioning by supporting planning and strategy development as discussed above. For young children, we think about this skill related to helping children plan and engage in play. By using a visual to help structure what to build in blocks (e.g., a house, apartment, airport, or garage) or providing a play script with three steps within a play theme (e.g., a) build a race track, b) get some vehicles, c) race the vehicles on the track) teachers can help young children more appropriately engage during open-ended play. Figure 2 offers an example of how this play script may look. Please note that visuals can be simple and use the materials that exist in your classroom.

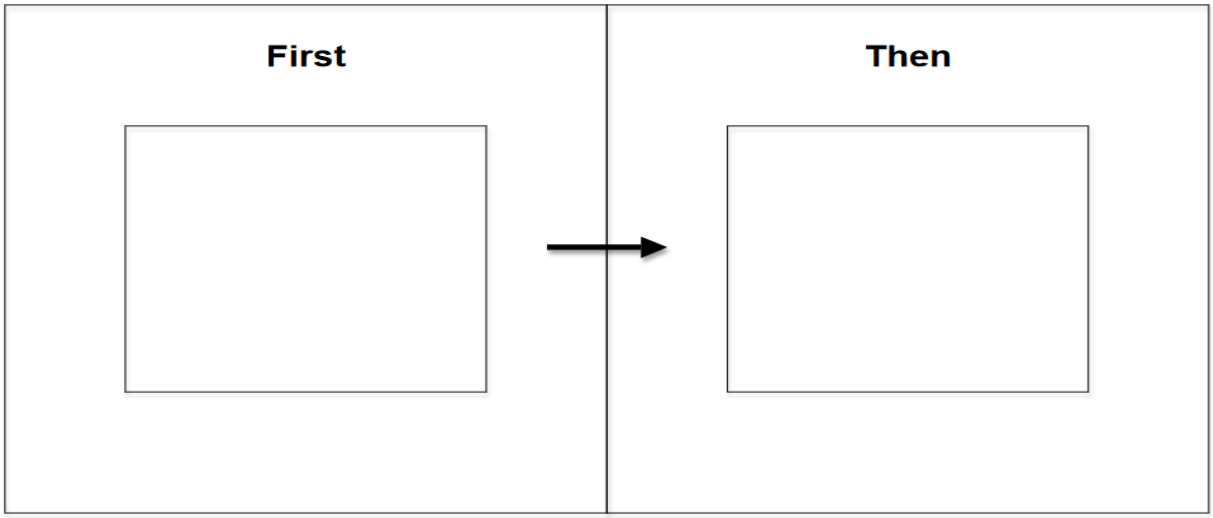
Figure 2.

Sample Play Script

Build Road	Drive Car	Pick up Passenger
		

Similarly, a first/then visual (Figure 3) can be implemented to provide additional structure around the expectations for certain routines, and help children begin to mark time and self-reflect. To use these tools, teachers put select two images or words. In the “first” box, the first task that must be completed should be indicated. The “then” box should show the child what will occur after the first task is completed. This tool can be especially useful for helping young children see the reward or preferred activity that will occur after the completion of a non-preferred task.

Figure 3.
First/Then Visual



Offering Choice

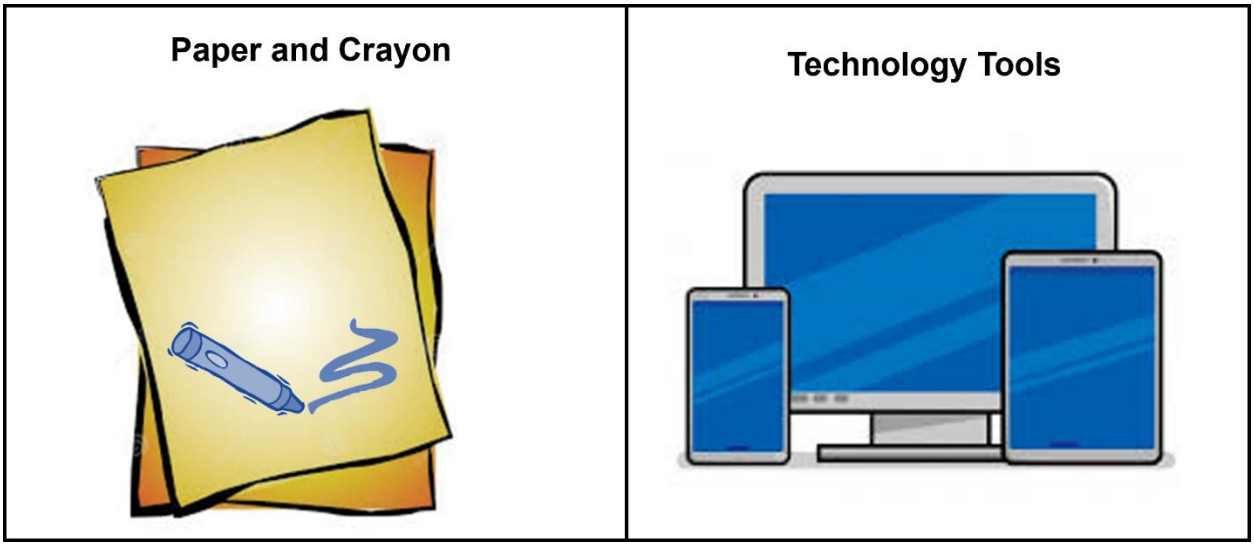
All school year, Mr. Mike has been working with the children in his classroom to learn number order and counting to 20. From his informal observations, he believes that most of the children understand the basic number concepts, but he would like to collect data to share with parents and school administrators. Mr. Mike knows that a few of the children in his class have language delays that impact their ability to respond when he asks them to verbally share what they know; he fears that an oral assessment may provide inaccurate data for these students. Conversely, Mr. Mike has noticed that a few of the children love to talk to him and will be excited to share what they know. Based on the preferences and needs of the children in his classroom Mr. Mike decides to offer the children two ways to demonstrate their mastery of the skills: orally counting objects or counting images of objects on a worksheet and matching the correct number. Mr. Mike hopes that providing options will help all of the children feel comfortable and focus on showing what they know.

Providing choices to young children can enhance motivation for, and engagement in, learning (Jolivette et al., 2002). With guidance and support, the use of choice can be particularly beneficial for young children with more significant disabilities or behavior challenges (Lohmann et al., 2018; Shogren et al., 2004). Taber-Doughty (2005) found that when provided choice, students with significant disabilities have larger skill development and are more willing to

persist working on a task for an extended period of time. The vignette about Mr. Mike provides an example of one simple way teachers can provide young children with options for demonstrating their mastery of the learning material. Instruction in the preschool classroom provides a variety of opportunities to offer choices on a daily basis. Choices can be offered to young children throughout the day for both formal and informal assessment purposes. Examples of ways that young children may be offered choices in the assessment process include (a) working alone or with a classmate, (b) writing or drawing information, (c) using paper/crayon, or (d) technology tools.

Offering students choices such as the one depicted in Figure 4 has been shown to result in higher academic success for students with learning and behavior disabilities (von Mizener & Williams, 2009). In addition, providing choices leads to improved communication and social skills for young children with disabilities (Jolivette et al., 2002). Ultimately, when teachers afford their students choice, student motivation and participation increases (Blair et al., 2010) and children have opportunities to reflect on their preferences and practice autonomy and self-determination (McCormick et al., 2003).

Figure 4.
Choice Visual



Hands-On Learning Activities

Mrs. Janice teaches an inquisitive class of young children who are excited to begin a unit on plants. Since her students enjoy hands-on activities, Mrs. Janice carefully planned her lesson to incorporate manipulatives, physical objects, and several small activities that will help her preschoolers interact with the curriculum content in meaningful ways. Today's objective is for students to plant a seed and water and care for it. Mrs. Janice begins by reading a book about plants during circle time. She passes around a variety of gardening materials and packs of beans for her students to physically touch and manipulate during the story. After reading and discussing the book, she demonstrates how to plant a bean and posts images of the steps in the process on the board. The students excitedly return to their tables to begin. In her classroom, Mrs. Janice has one student with autism who has sensory issues. To support his needs, Mrs. Janice provides gardening gloves and a small shovel so that he will not need to touch the dirt nor the seed in order to plant it.

The use of physical objects that young children can touch and manipulate helps increase their understanding and comprehension of learning concepts (Nikiforidou, 2019). Research has found a strong connection between the use of manipulatives and long-term mathematical learning (Uribe-Florez & Wilkins, 2017). In order to support student learning with manipulatives and other physical objects, teacher guidance and instruction is necessary for supporting young children as they learn to use the tools for demonstrating their knowledge (Horan & Carr, 2018) and learning is enhanced when the manipulatives more closely resemble real-life objects (Carbonneau & Marley, 2015). For children with disabilities, including learning disabilities, autism, and intellectual disabilities, the use of manipulatives for mathematics instruction should follow the Concrete Representational Abstract (CRA) approach. This approach to mathematics instruction involves scaffolding children’s learning in three phases: (a) the use of manipulatives, (b) the use of visual representations such as drawings, and (c)mathematical problem completion without any visual supports (Bouck & Park, 2018). In the preschool classroom, it is appropriate to focus on the first phrase of this approach, but teachers should be aware that the goal is to move to the next phase over time.

In addition to the use of manipulatives for evaluating the learning of young children, teachers may also assess children's mastery of skills during authentic, real-world activities. When learning occurs through hands-on experiences, young children can construct their own learning experiences in a manner that is meaningful to them; this experience often enhances their learning and makes it more useful over the long-term (Kilbrink et al., 2014). Examples of hands-on learning experiences that can be used to assess the learning of young children include: (a) having children put objects in water and report whether they sink or float (Larsson, 2016), (b) letting children play in nature and observing their social interactions to evaluate their mastery of social skills (Kiewra & Veselack, 2016), and growing plants to show they understand the life cycle and plant care (Wheeler & Blank, 2011).

Conclusion

Early childhood teachers can incorporate multiple means of action and expression in their classrooms by offering their students opportunities to use technology, by providing visual representations, affording students choice in how they demonstrate learning and mastery, and by incorporating hand-on activities into their lessons. Providing young children in inclusive classrooms with multiple means of action and expression are useful tools to assist with assessment of both academic and behavioral goals and objectives. The strategies outlined in this article describe how including multiple means of action and expression help teachers track student progress toward mastery of academic and behavioral goals and objectives. When teachers incorporate a variety of formal and informal assessments, young learners have multiple opportunities to show they are understanding and learning instructional content. Both formative and summative assessment in early childhood classrooms are critical and should drive instructional decisions. Furthermore, assessments allow teachers to measure student knowledge and skills, identify strengths and target areas in need of improvement, track progress and growth, and adjust instructional content and delivery.

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