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Preschool and Kindergarten

Portfolio Picks: An Approach for Developing Children's Metacognition

AS A KINDERGARTEN TEACHER, I felt there was never enough time in the school day to accomplish everything I wanted to. There was so much for the children and me to explore, to learn, and to share that it was hard having to stop and assess their learning with the standardized assessments that my district expected me to administer. Portfolio assessment was different, however. The portfolios told the story of all that we had done over the year, they were a source of pride for me and the children, and perhaps most importantly, these assessments seemed to extend the children's learning rather than interrupt it. Years later, as a professor of education who teaches courses in cognition and learning, I have a better understanding of why portfolio assessment felt right to me as a teacher. Portfolio assessment not only documents learning but also can help children in preschool, kindergarten, and the primary grades develop a critical tool for learning—their own metacognition.

Benefits of portfolio assessment

Portfolios are systematic collections of children's work, artifacts, and teachers' notes that capture children's learning over time. Portfolio assessment offers an authentic approach to assessment that is developmentally appropriate (Seitz & Bartholomew 2008; Harris 2009). Like other forms of assessment, portfolio assessment gives teachers information about how to adjust their teaching and about the kinds of experiences that

might be most helpful to individual children. Unlike standardized assessments, portfolio assessment allows multiple opportunities and ways for children to demonstrate their understanding of concepts and ideas. Another advantage of portfolio assessment over standardized assessments is that they can communicate progress and learning in ways that are easier for families to understand (Gelfer 1994). Portfolios provide evidence of progress that is more apparent and often more meaningful to parents than a percentile score on a test. For example, portfolios can easily show improvements in children's writing skills from October to May.

From my experience, the most important benefit of portfolio assessment is that it provides children an opportunity for self-assessment. If children are included in the selection of their portfolio pieces, they can review their work, talk about their thinking process that occurred during the work, discuss their interests and habits, and make choices about which pieces to include. Portfolios also offer children a way of understanding their own progress. In my classroom, children often chose to look through their portfolios during choice time and commented about their own progress. One child looking through his writing samples said with a giggle, "Look! Remember when I didn't know how to spell *mom*? Now I can write *dinosaur*!" The opportunities portfolio assessment provides for children to engage in self-assessment are exactly the kinds of experiences that have been found to support the early development of metacognition—an aspect of cognition recognized as critical for learning (Larkin 2010).

What is metacognition?

Metacognition refers to "thinking about thinking," such as knowing what we know or do not know, monitoring the outcomes of our work, setting goals, and planning ahead. Children and adults with better metacognition tend to have higher academic achievement and be more successful (Larkin 2010). Better metacognition is also associated with greater reading comprehension; more coherent, elaborate writing; and better mathematics problem solving. Essentially, children with good metacognitive skills are self-directed learners who are able to self-evaluate and select new strategies when appropriate rather than rely on someone else to guide them (Bransford, Brown, & Cocking 2000). Thus, children with better metacognition get the most out of learning opportunities. For example, they monitor their comprehension as they read, notice when they do not understand something, and then do something about it, such as reread or seek help (Baker 2005). These behaviors allow them to learn more when they independently read books.

Like most other cognitive skills, metacognition develops slowly throughout childhood and into adolescence (Schneider 2008). Yet even 3-year-old children are capable of some forms of metacognitive thought (Lyons & Ghetti 2010). Children as young as 2½ years can comment on when they know or do not know something, such as when asked the name of an object. Between the ages of 3 and 5 years there is substantial improvement in children's ability to accurately reflect on the certainty of their memories, using words such as *know, think, forget*. This improvement is one indicator of an increasing awareness of knowledge states and the ability to reflect on the accuracy of their thinking. In time, children can monitor and regulate their thinking *during* a task and plan appropriately *before* a task. Children over the age of 5, for example, switch strategies more often than preschoolers during a task when their current strategy is not working.

While metacognition improves with age, it also can be developed through explicit training (Dignath, Buettner, & Langfeldt 2008). Teachers and families can promote children's metacognition by asking them to articulate their thinking during a task. For example, while doing a puzzle with a kindergarten child, simply asking, "How did you

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figure out where that piece belongs?," can help him learn to monitor and reflect on his own thinking. Teachers and families can also promote children's metacognition by asking them what they know about a topic, how they learned it, and what they want to know about it.

Portfolio Picks in a kindergarten classroom

Selecting pieces for portfolios offers the perfect opportunity to probe children's thinking about their work. Initially, it might seem overwhelming to involve children in the selection of their portfolio pieces, but I found that with just a little planning and organization it was quite manageable. In fact, studies have found that children as young as preschool age can be involved productively in the development of their portfolio (Gelfer & Perkins 1996; Seitz & Bartholomew 2008).

One way to involve children is to make the process a regular part of the classroom routine, culture, and environment. To do this, my co-teacher and I developed Portfolio Picks. This became the name of a yearlong bulletin board in the classroom that celebrated children's work and their reflections about that work, and also the name of monthly conferences dedicated to selecting the pieces that would be displayed.

Once a month, I met with each child in small groups of three or four children, sometimes over the course of a day and other times over the course of a week. During the conferences children looked through their "finished work" folder where they kept work or artifacts (such as a sign a child created for a block structure) completed each day. I talked with each child in turn, discussing his work and selecting one piece that would be displayed on the bulletin board. As children's new pieces were posted, the previous ones were transferred to their portfolio folders. In addition to the pieces selected with the children, I added other items to their portfolios to ensure that they contained multiple kinds of evidence—my anecdotal notes, results of formal assessments, and other artifacts that I selected independently.

Using portfolio assessment to promote children's metacognition

My strategies for helping children select appropriate portfolio pieces and to assess their own work changed over the course of the year as children exhibited greater ability to critically evaluate their work. Initially, I took most of the responsibility in guiding the child to a particular piece and describing why I thought it was a good choice. Gradually, I transferred that responsibility to the child. My role changed from leading the child's thinking, to eliciting and facilitating her thinking, to finally observing and commenting on her thinking. Thus, over the course of the year, I used three general strategies for supporting children's selection of portfolio pieces and promoting children's metacognition:

(1) Model and Think Aloud, (2) Conference and Co-Construct, and (3) Independent Self-Assessment and Articulation of Thinking About Thinking.

Each of these strategies differs in terms of its purpose and benefits to the child (Dignath, Buettner, & Langfeldt 2008). (See "Strategies for Supporting Children's Selection of Portfolio Pieces and Promoting Metacognition.") The purpose of the first strategy, Model and Think Aloud, is primarily for the teacher to model her own thinking. This approach provides children with an example of how to reflect on their work and also helps them acquire specific language that they can use to talk about their thoughts and evaluate their work, such as *hard, confusing, proud,* and *notice* (Bransford, Brown, & Cocking 2000; Larkin 2010). The purpose of the second strategy, Conference and Co-Construct, is to provide children with reflection questions they can ask themselves. These questions promote metacognitive discourse, which helps children become aware of their own thinking. The purpose of the third strategy, Independent Self-Assessment and Articulation of Thinking About Thinking, is to provide children with an opportunity to take on the responsibility for assessing their own work, to articulate and explain their self-assessment, and to set their own learning goals. This approach helps children see themselves as responsible for their own learning and feel validated for their metacognitive efforts (Darling-Hammond et al. 2003).

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While I typically use these strategies sequentially, the rate at which I moved through them was not the same for every child. Some children continued to need more scaffolding than others, such as some dual language learners who needed more modeling and thinking aloud until they developed the language to be able to comment on their own work. Also, sometimes I used more than one strategy during a child's conference. For example, I might begin a conference by having the child do an independent self-assessment. However, if I notice that the child seems to focus only on apparent or relatively superficial features of the work, such as the neatness of the handwriting, I might shift to the Model and Think Aloud strategy and comment on the complexity of the sentence structure in order to help the child to continue to develop more sophisticated forms of self-assessment.

These general strategies are consistent with approaches that have been found to promote metacognition. For example, there is much evidence that one way to support children's metacognition is by modeling the kind of thinking you want to promote (Darling-Hammond et al. 2003; Dignath, Buettner, & Langfeldt 2008; Larkin 2010). Teachers

can let children "see" their thinking processes by thinking aloud and describing their own reasons for selecting portfolio pieces.

The following examples from a kindergarten classroom demonstrate the three strategies for promoting children's self-assessment.

Model and Think Aloud: Pamela's menu

Pamela's conference occurred near the beginning of the year. She seemed timid and had a limited oral vocabulary. Thus, the teacher guided her toward a menu that Pamela had created with the teacher the day before and used the opportunity to model the self-assessment process.

Teacher: I think this piece would be a good choice for your portfolio.

Pamela: Yeah—I like it.

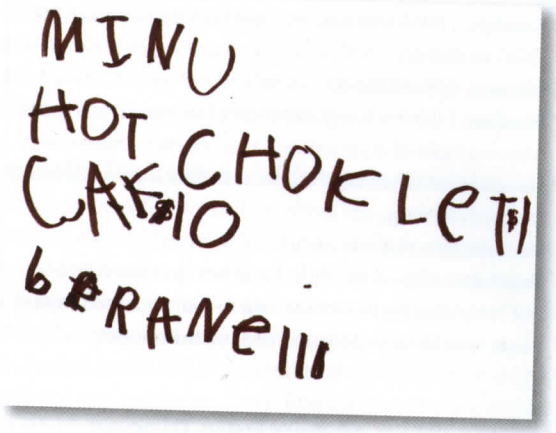
Teacher: I think it is a good choice because it is a really nice example of your writing. You needed a menu, and you decided to make one yourself! That was really good problem solving.

Pamela: *(giggles and nods)*

Teacher: I also remember that when you were figuring out how to write the words, like *menu*, you were saying them very slowly to try and hear all the sounds.

Strategies for Supporting Children's Selection of Portfolio Pieces and Promoting Metacognition

Model and Think Aloud	The teacher takes the lead and models her thinking process by making comments on the child's work. For example, ■ "Hmmm. I notice that on this work you included many details and chose your colors carefully. This seems to be a great example of being very careful in your work." ■ "I know that you have been working really hard on sounding out words. I wonder if there's a piece in here that shows that. Oh, look at this work!" ■ "This math work is interesting. What I notice is that you did a lot of erasing. That tells me that you noticed when an answer didn't seem right. I think this would be a great example because it shows how you are learning to fix your own mistakes."
Conference and Co-Construct	The teacher elicits the child's thinking about his work and recasts or elaborates on his ideas through prompts and leading questions. For example, ■ If the child is gravitating toward a certain piece: "Tell me about this piece. Why are you proud of it?" ■ "Do you remember doing this work? What parts do you remember thinking really hard about?" ■ "Do you notice something you did on this work that you couldn't do before? I notice that ..." ■ "You said you like the letters you wrote. Do you mean you like how carefully you wrote the letters or that you remembered to use some lowercase letters?" ■ "You said, 'It's beautiful.' Tell me more ... what do you think makes it beautiful? How did you come up with that idea?"
Independent Self-Assessment and Articulation of Thinking About Thinking	The child takes the lead, and the teacher builds on her "thinking about thinking" with comments. For example, ■ "Tell me more about what you learned from doing this work." ■ "So, what do you think you can do better? What might be a goal?" ■ "You are really thinking about what you had to think about when you were doing the work, not just what it looks like!" ■ "Based on what you noticed, how would you approach a work like this differently next time?"



Date: October 1, 2001

I am proud of this work because I wrote a lowercase e.

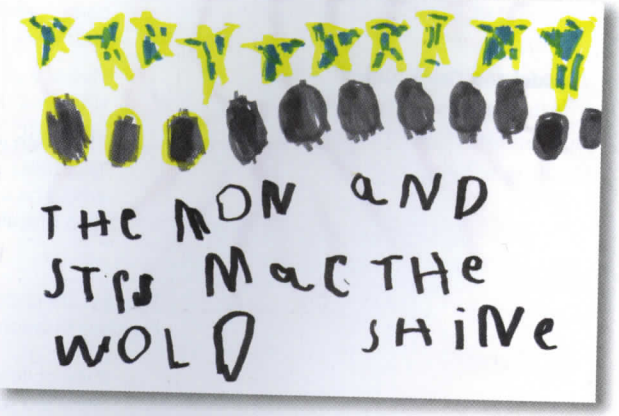
Pamela: *(nods and smiles)*
Teacher: I also noticed that you made a lowercase *b* and *e*. We've talked about trying to use lowercase letters more, and you did it here!
Pamela: *(nods and smiles)*
Teacher: Hmm ... so what do you think we should write about this work? *(pause)* Why are you proud of it? *(pause)* What does it show you have learned?
Pamela: I made a little *e*.
Teacher: OK. I'll write, "I'm proud of this work because I wrote a lowercase *e*."

In this example, the teacher takes the lead in selecting a piece and describing why it is a good choice. She also carefully models the kind of language that is central to metacognition and self-assessment, such as *remember, noticed,* and *proud*. This type of interaction helps children understand the various aspects that are important to consider, such as achieving the goal of writing lowercase letters and developing the vocabulary to communicate their own thoughts and ideas about their work.

Conference and Co-Construct: Alessandra's picture of stars and moons

Alessandra's conference took place near the middle of the year. As she looked through the pieces in her finished work folder, she gravitated toward a writing sample in which she had drawn several moons and stars and had written, "The moon and stars make the world shine." Noticing her interest in this piece, the teacher decided to focus the conference on it.

Teacher: So, tell me. Why did you choose this work? Why are you proud of it?
Alessandra: Because I made it.
Teacher: What do you mean by that?
Alessandra: Because I drawed it and I drawed the words.
Teacher: Can you tell me something about the words that you are proud of?
Alessandra: Sounding out.
Teacher: Do you remember which word was hard for you?
Alessandra: I listened carefully [to the sounds] in moon.
Teacher: I noticed you also remembered your expert word *the*.
Alessandra: Yeah, and I writed all the letters by myself.
Teacher: OK, we'll add this piece to your portfolio. It shows a lot of thinking and how much you are growing as a writer!



Date: October 4, 2001

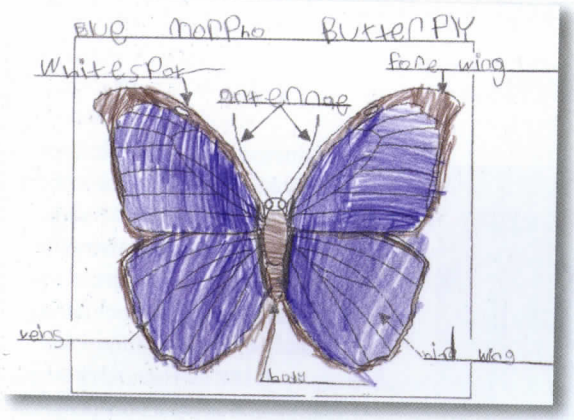
I am proud of this work because I sounded-out moon.

In this example, the teacher encourages the child to evaluate her own work. She follows the child's lead about which piece to discuss and begins by asking the child to describe why it is a good choice for her portfolio. Throughout the interaction, however, the teacher plays a key role in helping elicit and expand the child's thinking and comments. This kind of interaction helps children develop more sophisticated forms of self-assessment and metacognitive language through scaffolding, while passing some of the responsibility on to the child.

Children's artwork courtesy of the authors

Independent Self-Assessment and Articulation of Thinking About Thinking: Josephine's research from the science center

Josephine's conference occurred toward the end of the year. Prior to meeting with the teacher to discuss her work, she had independently selected a butterfly piece. She had completed it after observing live butterflies in the science center and using books in the center to identify the parts of a butterfly.



Date: April 12, 2001

I am proud of this work because I learned some new parts of the butterfly

What I could do better: I could try to write all my letters right on the line.

Teacher: So, tell me. Why did you choose this piece?
Josephine: Well, I'm proud of it because I wrote all the parts of the butterfly.
Teacher: OK. What else?
Josephine: Well, I learned some parts of the butterfly I didn't already know.
Teacher: Great. So this work shows what you have learned in science. When you look at this piece, do you see something that you still need to work on ... something that you might try to do better next time?
Josephine: Hmm. I could write a little neater, like keep on the lines. The e and the s are off the lines.
Teacher: Your handwriting has come a long way, but I think that is a good goal to keep working on.

In this example, the child takes the lead in evaluating her work. She independently selects the piece she wants to discuss and identifies its strengths and potential areas for improvement. The teacher's role is to allow the child the opportunity to articulate her self-assessment and to validate her thoughts. This kind of interaction helps children view themselves as responsible for monitoring their own learning and setting their own goals.

Conclusion

As early childhood educators, we want to develop children's skills and content knowledge, but we also want to help them take the initiative for their own learning. Involving children in the selection of their portfolio pieces offers them opportunities to develop their metacognitive skills. Through portfolio assessment we can both document children's learning in our classrooms and help prepare them to be self-directed learners in the future.

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