

Planning for Processing Time Yields Deeper Learning

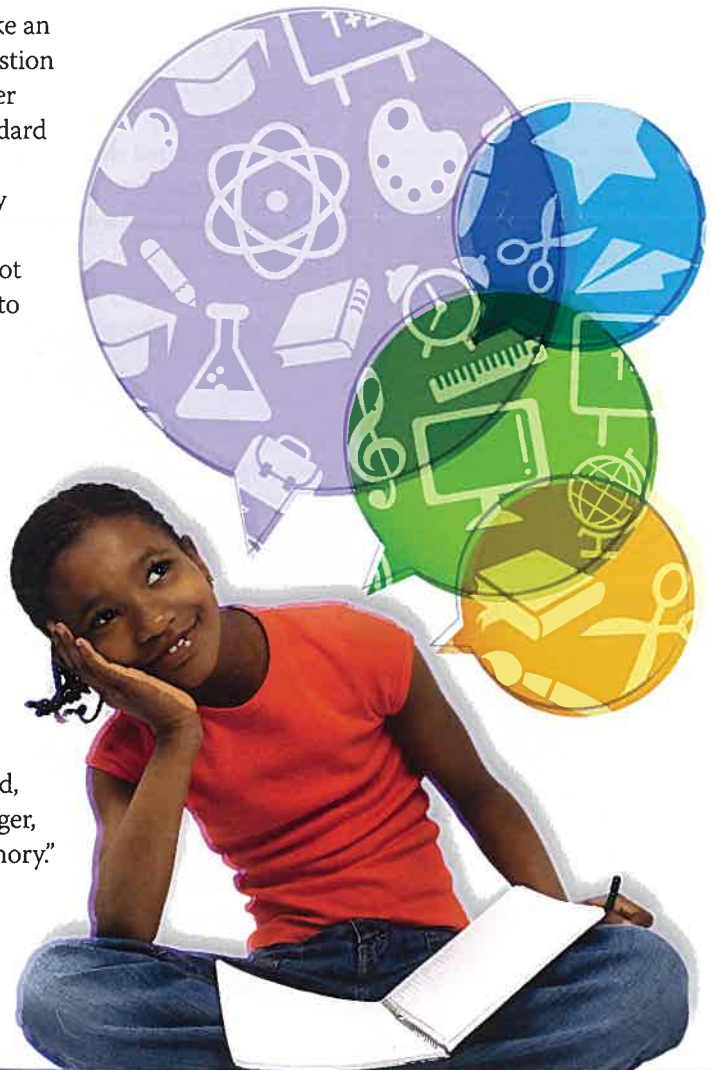
Students need lessons that allow time to interpret information and formulate an appropriate response.

DJs and teachers often share a common fear: the dreaded dead air. Like an awkward quiet between songs, a seemingly endless silence after a question has been posed can be enough to send even the most seasoned teacher into a panic. Building processing time into lessons has long been standard in special needs classrooms, but every student, regardless of learning pace, benefits from increased and better quality think time. As Wendy Ostroff, ASCD author and associate professor in the Program for the Advancement of Learning at Curry College, says, "Faster learning is not necessarily deeper learning. In our fast-paced culture, that is difficult to remember."

Why Think Time?

The classroom teacher's goal is to successfully integrate material into a student's working, relational, and ultimately permanent memory. When students are rapidly overloaded with material, however, the teacher's chances of achieving this goal decrease. Judy Willis, an ASCD author and noted authority in the field of learning-centered brain research and classroom strategies, explains, "Every brain needs periodic rests during which neurotransmitters can be replenished and executive function can process the new material. You can see when your students are entering a state of depletion of neurotransmitters in their synapses, as they will become fidgety, distracted, and unfocused. When this happens, information processing takes longer, leading not only to student frustration, but also to less successful memory."

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Planning for Processing Time

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Increasing processing time in the classroom begins with investigating preconceived ideas about how long it should take for students to “get” new information. “The most common misconception about processing time is that those who process slower are comprehending less or are inferior learners,” says Ostroff. “In fact, students with processing speed disorders often do very well on tests of achievement (e.g., math reasoning, word reading).

Jillian Darefsky, the cohead of school at The Siena School in Silver Spring, explains, “Students need to hear the information, process it, and provide a response. Actively providing at least four to five seconds of think time is an essential component of lesson planning. This multistep process seems easy and natural to the majority of people but can be incredibly frustrating for some students. Imagine being one of the smartest students in the room but having difficulty participating in a class discussion or answering a question posed by the teacher because it takes you longer than your peers to formulate a response. For these students, think time needs to be much longer than four to five seconds.”

Teachers face constant pressure to cover material in an extensive but timely manner; however, the amount of information students are expected to process every day can be overwhelming. “People don’t always consider the complexity of what we ask our students to do six to seven hours a day,” continues Darefsky.

“Some students quickly respond with ‘I don’t know,’ and the teacher wrongly assumes they don’t understand the material. In reality, they may know, it’s just they haven’t had the opportunity to formulate a response. Alternatively, some teachers assume students aren’t paying attention or are off task when they simply require more processing time than their peers.”

Although it takes conscious effort and creativity to build effective think time into lessons, the rewards are undeniable. “Teachers who deliberately plan think time into their lessons tend to elicit deeper responses from their students, and more students participate in class activities and discussions,” says Darefsky.

How to Build In Think Time

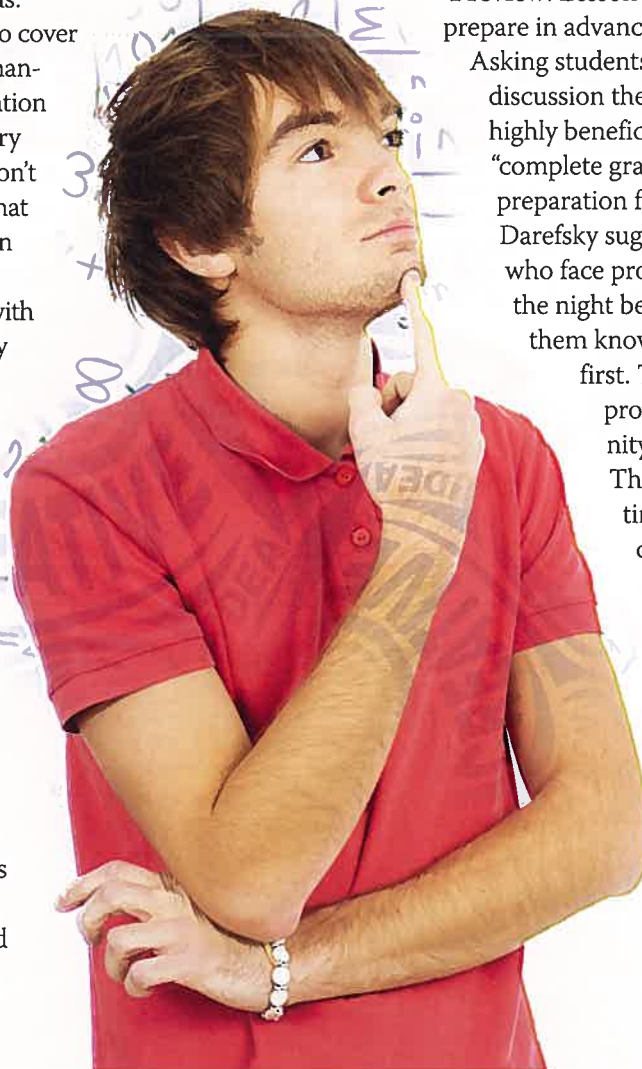
Set goals that work for everyone. Decide which idea is most important in a particular lesson, and consider a variety of ways for all students—regardless of their processing speed—to gain that understanding. “When planning lessons,” Darefsky suggests, “deliberately plan opportunities to provide at least four to five seconds of think time (more for students with language and processing difficulties), and take think time into consideration when deciding what will be achieved during the class.” Ostroff adds, “Teachers and adults should understand that every child will arrive at learning outcomes in very different ways. They should strive to create a classroom in which all learners are measured by successes that are applicable to them.”

Enjoy the silence. “Being comfortable with silence is not an easy thing to do,” acknowledges Darefsky, “but it is essential. Teachers have a tendency to fill the silence after a question is posed, viewing it as an uncomfortable void rather than an opportunity for the students to process what is being asked of them.” She suggests, “Learn to appreciate silence in the classroom. If you think you have a tendency to rush the students, count to 10 before breaking the silence!”

Preview. Lesson previewing can help students prepare in advance for the following day’s class.

Asking students to prepare for the next day’s discussion the evening before can also be highly beneficial, adds Darefsky. Students can “complete graphic organizers on the topic in preparation for a discussion” as homework. Darefsky suggests privately providing students who face processing delays with a question the night before a discussion and letting them know that they will be called on first. This gives the students increased processing time and the opportunity to contribute to the discussion. Think-pair-share is another think time–friendly alternative to whole-class discussion.

Get physical! Instead of continuously barreling through material for an entire class period, build minibreaks into the schedule to help integrate material into student memory. Willis explains, “This doesn’t mean major activity. Simply stretching and changing to a different position in the classroom, such as sitting on the floor, can



provide a fresh outlook. A bit of physical activity, such as jumping jacks, can be quite revitalizing. During these rests, the newly learned material has the opportunity to go from working or short-term memory to relational memory while students relax and refresh their supply of neurotransmitters.”

Partial participation. When the goal is for students to understand a concept in a deeper way, partial participation is an effective strategy. It allows all students to approach a common curriculum using different tactics. “For example,” says Willis, “students whose faulty memory tracking slows their mastery of the multiplication tables may need to use calculators temporarily. Other students may initially need to write their notes about the new topic on outlines that are already partially filled in. This strategy keeps students motivated because they are stimulated by suitable challenge while working within their own comfort zones.”

While this process does require careful student observation to ensure that teachers can give specific feedback and adjust the level of challenge, Willis suggests that partial participation “creates opportunities for discovery learning within each student’s *zone of proximal development*—the gap between the student’s current or actual level of development and his or her potential level of development—while avoiding the frustration or resentment that activates the information-blocking power of the affective filter.”

Chunk! Break down larger themes and ideas into smaller, more manageable steps. This will make it easier for each idea to work its way into the student’s long-term understanding.

Get creative with connections. Link subject matter to the real world through art, literature, film, storytelling, and hands-on activities. Incorporate kinesthetic activities, drama, charades, artistic responses, music, and hands-on building or fixing into a lesson plan. Through these activities and real-world links, students are able to make deeper connections to the subject matter. These activities also allow time for students to “cement” the information in their memory while using it in new, brain-building ways. Explains Willis, “The goal is to provide an inclusive experience that will resonate with each student.”

Repeat, rephrase, relay. Teachers should make sure to expose students to new material multiple times before assessing their retention of the information.

Provide and practice. For students with processing difficulties, Darefsky suggests providing both written and verbal information, increasing processing time for one-on-one conferences, and shortening assignments as they will need more time than their peers to complete them.

Adds Ostroff, “Children with processing speed issues also tend to look at the big picture of a problem first and then break it down into pieces, which takes considerably longer. Interventions for these students involve predicting words from a context and practicing timed activities. It is important that these students have time to work on fluency—or the automatic ability to answer simple questions quickly.”

Syn-naps refill the tank. Willis suggests that teachers build in more effective think time by utilizing “syn-naps,” or brain rests, during instruction. “Students can start the break with a complete change of pace by drinking water, stretching, singing, dancing, or taking a bathroom break.”

In the same way in which a quick change of setting or subject can be restorative for adults, these regular syn-naps refresh students’ processing abilities. Willis finds that, “Not only do they prevent overloading of the circuits and interference with maximal memory storage conditions, but they also help maintain positive emotional states.

Carefully planning these syn-naps for times when students are feeling good—every 15 minutes for complex and/or lectured material—also helps to avoid negative associations with the subject. Says Willis, “The best time to give students ‘syn-naps’ is before synaptic overload causes them to tune out and act out.” Willis also advises that following a syn-nap with an activity is critical to “cementing the working memory into relational and long-term memory.” Creating Venn diagrams, generating mental images, and creating metaphors and analogies all help students to solidify material after a brain rest.

Regardless of the processing speeds of students, building effective think time into every lesson ensures that students gain deeper and more positive comprehension. By understanding and using processing time more effectively, teachers can conquer their fear of dead air and enable students to more firmly grasp the concepts being taught. **EU**

—JESSICA ROAKE

