

Core Function: Personalized Learning

Effective Practice

Cognitive Competency: Intentionally address students' accessible background knowledge to facilitate new learning

Overview: Cognitive competency involves building students' prior knowledge to better allow for mastery of learning materials. Research-based practices to foster students' cognitive competency include regularly reviewing materials and concepts (particularly those which will be used for subsequent learning), using effective classroom questioning (to include both lower and higher-level questions, appropriate wait time, and Socratic questioning), and plenty of direct and explicit vocabulary instruction.

Evaluate your Practice: How can teachers help students build their background knowledge through effective review/recitation strategies in order to facilitate new learning? How can teachers help students build their knowledge by promoting their vocabulary development in order to facilitate new learning?

Introduction

Learner-centered or personalized learning refers to “a teacher’s relationships with students and their families and the use of multiple instructional modes to scaffold each student’s learning and enhance the student’s personal competencies” (Twyman & Redding, 2015, p. 3). The student is actively involved with the teacher in co-constructing their individualized learning pathway, and the location, time, and pace of learning may vary from student to student (Redding, 2016). Cognitive competency, one of four personal competencies within recent personalized learning frameworks, refers to “prior knowledge that facilitates new learning” (Redding, 2014, p. 4). Building students’ knowledge through effective classroom recitation practices and intentionally fostering students’ vocabulary development are two key ways that teachers can help students build their prior knowledge, setting the stage for enhanced cognitive competency and improved learning.

How can teachers help students build their background knowledge through effective review/recitation strategies in order to facilitate new learning?

Teachers can foster the building of students’ knowledge and cognitive competency through research-based practices that include effective review and teacher questioning strategies.

Regular Review of Previously Learned Material. This practice is critical to helping students expand their knowledge base and foster new learning (Rosenshine, 1986) and is particularly essential for material that will be used for subsequent learning. These concepts and skills should be developed continually over time, with students engaged in distributed practice (Marzano, 2004). Important content should also be revisited “in incrementally deeper and broader steps until the end of the course or grade to ensure deep and lasting learning” (Rogers, 2013, p. 61). When re-teaching is necessary, it should involve the use of different materials and examples than those used for initial instruction; re-teaching of priority lesson content should continue until students demonstrate they have learned it (Cotton, 1995). Digital learning instructional activities that include review and reinforcement components can provide individualization and personalization to allow for students to develop mastery of course materials.

Use of Effective Classroom Questioning Techniques. Effective learning and achievement requires student engagement, with plenty of opportunities to respond to instruction (Harbour, Evanovich, Sweigart, & Hughes, 2015). Skillful questioning using both lower-cognitive (fact and recall) and higher-cognitive (open-ended and interpretive/evaluative) questions facilitates students’ acquisition of conceptual knowledge and, ideally, can lead to deeper learning

(Chin, 2007; Gall, 1984; Harbour, et al., 2015). Some research has suggested that higher-cognitive questions contribute to higher student achievement (Redfield & Rousseau, 1981); teachers should ask a majority of these types of questions when teaching students above the primary grades (Cotton, 1995). Teachers should also ensure that both faster and slower learners have opportunities to respond to higher-level questions (Slavin, 1994).

Teacher questioning should allow for generous amounts of “wait time” or “think time;” at least three seconds for lower-cognitive questions and more for higher-cognitive ones (Ciardiello, 1986; Slavin, 1994; Stahl, 1994). When students give incorrect or incomplete answers, teachers should probe for understanding and help them produce correct or better answers (Slavin, 1994). During whole-group questioning, teachers should reiterate, or “re-voice” student responses to their questions, in order to both affirm student responses and make their ideas available to the whole class as common knowledge (Chin, 2007). Teacher questioning within inquiry-based classrooms, which allow students to construct their own meanings (rather than solely relying on teacher provided information), share thoughts and ideas, and guide discussions, can lead to greater cognitive engagement and learning (Chin, 2006; Smart & Marshall, 2013). Questioning techniques such as Socratic questioning, which involve teachers facilitating guided discussions by responding to student comments and questions with deeper, probing questions to further develop student understanding of subject matter, can encourage students to self-evaluate their responses, leading them to reflect on and improve the accuracy and depth of their understanding (Chin, 2006).

How can teachers help students build their knowledge by promoting their vocabulary development in order to facilitate new learning?

Vocabulary has long been recognized as a strong determinant of reading success and is key to helping students expand their accessible knowledge and thus enhance new learning. Young children who enter school with limited vocabulary knowledge are at greater risk for later reading difficulties, particularly with reading comprehension (Catts, Fey, Zhang, & Tomblin, 2001), and vocabulary gaps only grow larger in the early grades (Biemiller & Slomin, 2001). Teaching vocabulary throughout the school years is not just a learning process for those struggling with or learning the English language, but also for

all students as they master new content and skills (Sniad, 2016). Features of effective vocabulary instruction include (a) direct, explicit instruction that includes extensive teacher modeling; (b) teacher and material scaffolding that carefully controls the level of task difficulty; and (c) numerous practice opportunities with immediate and specific feedback (Coyne, McCoach, & Kapp, 2007; Vaughn, Gersten, & Chard, 2000). This explicit and direct instruction with plenty of practice with vocabulary should include practices that

- Help students relate new vocabulary to their background knowledge (e.g., through pre-reading vocabulary- building exercises)
- Help students develop elaborated word knowledge (e.g., help students express word meanings in various ways through drawing pictures or creating other non-linguistic representations, creating metaphors and analogies, creating graphic organizers, and using vocabulary learning logs);
- Provide for active student involvement in learning new words (e.g., having students create a visual word wall using pictures that represent various concepts being taught); and
- Help students acquire new vocabulary independently (e.g., teach students what to do when they encounter an unfamiliar word and increase word exposure through supplemental reading). (Carr & Wixson, 1986, as cited in Lent, 2012, pp. 58–59)

Indicators to Support the Effective Practice
The School Community Council ensures that all parents understand the purpose of a standards-aligned curriculum, their own children’s progress, and their role in supporting learning at home.
The School Community Council ensures that all volunteers understand cognitive competency and their roles relative to its enhancement in students.
All teachers and teacher teams plan instruction based on the aligned and expanded curriculum that includes rich reading, writing, memorization, and vocabulary development.
All staff conducting co-curricular programs fulfill the purposes of the programs including appropriate elements of the aligned curriculum and other cognitive competency activities.

Indicators to Support the Effective Practice
The school's key documents explain the value of cognitive competency and how it is enhanced through specific roles and relationships.
The school promotes cognitive competency in school rituals and routines, such as morning announcements, awards assemblies, hallway and classroom wall displays, and student competitions.
All teachers reinforce elements of mastered knowledge that can be retained in memory through recitation, review, questioning, and inclusion in subsequent assignments.
All teachers include vocabulary development (general vocabulary and terms specific to the subject) as learning objectives.
All teachers assign rich reading and the application of the reading in written work and discussion.

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