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TOP 20 PRINCIPLES FROM PSYCHOLOGY FOR PREK–12 TEACHING AND LEARNING OF STUDENTS WITH DISABILITIES

Center for Psychology in Schools and Education

TOP 20 PRINCIPLES FROM PSYCHOLOGY FOR PREK–12 TEACHING AND LEARNING OF STUDENTS WITH DISABILITIES

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CONTENTS

INTRODUCTION5

METHODOLOGY6

TOP 20 PRINCIPLES8

 Principle 1: Students’ beliefs or perceptions about intelligence and ability affect their cognitive functioning and learning8

 Principle 2: What students already know affects their learning 10

 Principle 3: Students’ cognitive development and learning are not limited by general stages of development 12

 Principle 4: Learning is based on context, so generalizing learning to new contexts is not spontaneous but instead needs to be facilitated 14

 Principle 5: Acquiring long-term knowledge and skill is largely dependent on practice 15

 Principle 6: Clear, explanatory, and timely feedback to students is important for learning..... 16

 Principle 7: Students’ self-regulation assists learning, and self-regulatory skills can be taught17

 Principle 8: Student creativity can be fostered 18

 Principle 9: Students tend to enjoy learning and to do better when they are more intrinsically rather than extrinsically motivated to achieve..... 21

 Principle 10: Students persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals 22

 Principle 11: Teachers’ expectations about their students affect students’ opportunities to learn, their motivation, and their learning outcomes..... 24

 Principle 12: Setting goals that are short term (proximal), specific, and moderately challenging enhances motivation more than establishing goals that are long term (distal), general, and overly challenging 25

 Principle 13: Learning is situated within multiple social contexts27

 Principle 14: Interpersonal relationships and communication are critical to both the teaching-learning process and the social-emotional development of students 28

 Principle 15: Emotional well-being influences educational performance, learning, and development 30

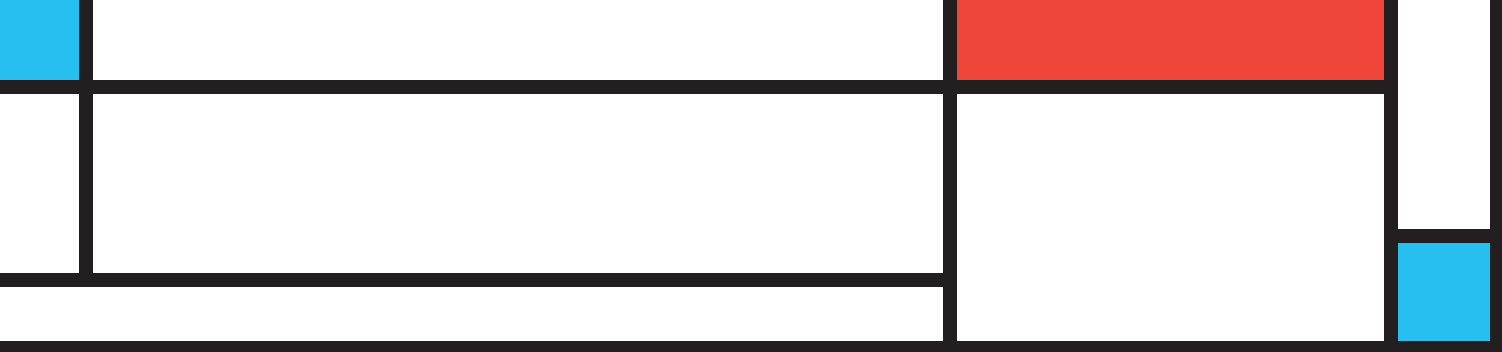
 Principle 16: Expectations for classroom conduct and social interaction are learned and can be taught using proven principles of behavior and effective classroom instruction..... 33

 Principle 17: Effective classroom management is based on (a) setting and communicating high expectations, (b) consistently nurturing positive relationships, and (c) providing a high level of student support. 35

 Principle 18: Formative and summative assessments are both important and useful but require different approaches and interpretations.37

 Principle 19: Students’ skills, knowledge, and abilities are best measured with assessment processes grounded in psychological science with well-defined standards for quality and fairness. 38

 Principle 20: Making sense of assessment data depends on clear, appropriate, and fair interpretation. 40



TOP 20 PRINCIPLES FROM PSYCHOLOGY FOR PREK-12 TEACHING AND LEARNING OF STUDENTS WITH DISABILITIES

PRINCIPLE 1

Students' beliefs or perceptions about intelligence and ability affect their cognitive functioning and learning.

PRINCIPLE 2

What students already know affects their learning.

PRINCIPLE 3

Students' cognitive development and learning are not limited by general stages of development.

PRINCIPLE 4

Learning is based on context, so generalizing learning to new contexts is not spontaneous but instead needs to be facilitated.

PRINCIPLE 5

Acquiring long-term knowledge and skill is largely dependent on practice.

PRINCIPLE 6

Clear, explanatory, and timely feedback to students is important for learning.

PRINCIPLE 7

Students' self-regulation assists learning, and self-regulatory skills can be taught.

PRINCIPLE 8

Student creativity can be fostered.

PRINCIPLE 9

Students tend to enjoy learning and to do better when they are more intrinsically rather than extrinsically motivated to achieve.

PRINCIPLE 10

Students persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals.

PRINCIPLE 11

Teachers' expectations about their students affect students' opportunities to learn, their motivation, and their learning outcomes.

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Setting goals that are short term (proximal), specific, and moderately challenging enhances motivation more than establishing goals that are long term (distal), general, and overly challenging.

PRINCIPLE 13

Learning is situated within multiple social contexts.

PRINCIPLE 14

Interpersonal relationships and communication are critical to both the teaching-learning process and the social-emotional development of students.

PRINCIPLE 15

Emotional well-being influences educational performance, learning, and development.

PRINCIPLE 16

Expectations for classroom conduct and social interaction are learned and can be taught using proven principles of behavior and effective classroom instruction.

PRINCIPLE 17

Effective classroom management is based on (a) setting and communicating high expectations, (b) consistently nurturing positive relationships, and (c) providing a high level of student support.

PRINCIPLE 18

Formative and summative assessments are both important and useful but require different approaches and interpretations.

PRINCIPLE 19

Students' skills, knowledge, and abilities are best measured with assessment processes grounded in psychological science with well-defined standards for quality and fairness.

PRINCIPLE 20

Making sense of assessment data depends on clear, appropriate, and fair interpretation.

INTRODUCTION

Psychological science has much to contribute to enhancing teaching and learning in the classroom. Teaching and learning are intricately linked to social and behavioral factors of human development, including cognition, motivation, social interaction, and communication. Psychological science can also provide key insights on effective instruction, classroom environments that promote learning, and appropriate use of assessment, including data, tests, and measurement, as well as research methods that inform practice. In 2015, the Coalition for Psychology in the Schools and Education published the most important principles from psychology—the “Top 20”—that would be of greatest use in the context of PreK–12 classroom teaching and learning, as well as the implications of each as applied to classroom practice. Each principle is named and described, relevant supporting literature is provided, and its relevance for the classroom is discussed. These principles impact all learners, regardless of special education needs.

We present here a supplement for use in the context of PreK–12 classroom teaching and learning, as well as the implications of each principle as applied to classroom practices for students with disabilities. Each principle is named and described, relevant supporting literature is provided, and its relevance for the special education students is discussed. This version of the principles is aimed at providing updated research explicit to special education students and relevance to teachers working with students with disabilities. The authors recognize that students with disabilities are students first. For this reason, a few of the psychological principles (e.g., Principle 5) were not changed significantly from the original Top 20, while others (e.g., Principle 11) have more noteworthy updates to reflect the unique learning needs of special education students.

This work of identifying and translating psychological principles for use by PreK–12 practitioners was conducted by a coalition of psychologists, known as the Coalition for Psychology in Schools and Education, that is supported by the American Psychological Association (APA). The coalition is an ideal group for translating psychological science for classroom use because its members collectively represent a wide spectrum of subdisciplines in psychology, including evaluation, measurement, and statistics; developmental psychology; personality and social

psychology; the psychology of aesthetics, creativity, and the arts; consulting psychology; educational psychology; school psychology; counseling psychology; community psychology; psychology of women; media psychology and technology; group psychology and group psychotherapy; psychological study of men and masculinity; and clinical child and adolescent psychology. Also involved in the coalition are psychologists representing communities of educators and scientists, as well as specialists in ethnic minority affairs; testing and assessment; teachers of psychology in secondary schools; children, youth, and families; and psychology honor societies. Coalition members are employed in K–12 schools and in colleges and universities in education, liberal arts, and science divisions. Some members are in independent practice. All hold expertise in psychology’s application to early childhood, elementary, secondary, or special education. This coalition specifically, and APA generally, has been putting psychological science to work for PreK–12 education for over a decade. There are many modules and white papers for teachers on the APA website (<http://www.apa.org/ed/schools/cpse>). The Top 20 project was modeled after APA’s earlier effort of identifying Learner-Centered Psychological Principles (1997). This initiative updates and broadens those principles.

METHODOLOGY

The method to derive the Top 20 principles was as follows. The coalition, operating in the mode of a National Institutes of Health consensus panel, engaged in a series of activities. First, each member was asked to identify two constructs, or “kernels” (Embry & Biglan, 2008), from psychology thought to be most essential for facilitating successful classroom teaching and learning. This process led to the identification of approximately 45 kernels/principles. Next, steps were taken to categorize, validate, and consolidate these principles. The first step was to cluster the 45 principles according to key domains of classroom application (e.g., How do students think and learn?). This was conducted in an iterative process across several meetings of the coalition. Second, a validation procedure for the 45 principles was undertaken. Several national blueprint publications related to teaching were analyzed to assess whether each of these principles also had been identified by the broader community of educators as critical to teacher practice. Cross-checking analyses were conducted on APA’s standards for high school curriculum in psychology; the PRAXIS Principles of Learning and Teaching examination from the Educational Testing Service; documents from the National Council for the Accreditation of Teacher Education; the InTASC (Interstate Teacher Assessment and Support Consortium) standards; a popular educational psychology textbook; and the National Association of School Psychologists’ Blueprint for Training and Practice. These documents were searched for evidence of what teachers were expected to know or be able to do and whether these expectations could be linked to the principles that the coalition had identified. There was support for all principles in one or more documents. Hence, all were retained for the next step in the validation process.

To identify the most important of the 45 principles/kernels, we used a modified Delphi process (modeled after the Institute of Medicine’s report *Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula*). Using a scale system, four coalition members rated each of the principles and assigned each a high, medium, or low priority score (1–3). Mean scores for each item were calculated. Based on the mean scores, low-priority principles were discarded, leaving 22 principles. These were then analyzed for their relation to each other and were synthesized into the final 20 presented here.

These Top 20 were then placed into five areas of psychological functioning. The first eight principles relate to cognition and learning and address the question **How do students think and learn?** The next four (9–12) discuss the question **What motivates students?** The following three (13–15) pertain to the social context and emotional dimensions that affect learning and focus on the question **Why are social context, interpersonal relationships, and emotional well-being important to student learning?** The next two principles (16–17) relate to how context

can affect learning and address the question **How can the classroom best be managed.** Finally, the last three principles (18–20) examine the question **How can teachers assess student progress?**

The special education community was informally surveyed to see if it might be useful to have a supplemental version that addressed the 20 principles with respect to students with disabilities. The response was encouraging. Thus, a panel of psychologists and researchers with expertise relevant to each of the principles was established to update and expand each principle to incorporate relevant evidence on research on students with disabilities and special education practices. Initial draft principles were also shared with relevant experts. For example, the last three principles on assessment were shared at the Council for Chief State School Officers (CCSSO) state collaborative on Assessment, Standards, and Education for Students with Disabilities (ASES) and a focus group with special education teachers reviewed the relevance for teachers to provide feedback.

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How do students think and learn?

PRINCIPLE 1 Students' beliefs or perceptions about intelligence and ability affect their cognitive functioning and learning.

EXPLANATION

Students who believe intelligence is malleable are likely to adhere to an “incremental” or “growth” mind-set about intelligence. Those who hold the opposite view, that intelligence is fixed, tend to adhere to the “entity” theory of intelligence. Students holding to the latter view may focus on performance goals and believe that they continually need to demonstrate and prove their intelligence, making them more hesitant to take on highly challenging tasks and more vulnerable to negative feedback than students holding an incremental view. Students with an incremental mind-set generally focus on learning goals and are more willing to take on challenging tasks in an effort to test and expand (as opposed to defensively prove) their intelligence or ability. Hence, they rebound more easily from negative feedback and failure. Accordingly, students who believe that intelligence and ability can be enhanced tend to perform better on a variety of cognitive tasks and in problem-solving situations.

One evidence-based approach to fostering a growth mind-set is framed in terms of the attributions that teachers assign to student performance. When students experience failure, they are likely to ask “why?” The answer to that question is a causal attribution. Attributions that tend to blame one's ability (“I failed because I'm just not smart enough” or “I can't read because I have dyslexia”) are associated with the view that intelligence is fixed. In contrast, attributions that blame lack of effort (“I failed because I didn't try hard

enough” or “I can't read yet because I need more time and a different type of instruction to learn phonics”) generally reflect an incremental or growth view of intelligence. In general, students are better able to cope when failure is attributed to a lack of effort or strategy rather than to low ability because the former is unstable (effort fluctuates over time) and controllable (students can generally try harder if they want to).

RELEVANCE FOR TEACHERS

When teachers attribute a student's poor performance to controllable and modifiable causes such as effort, instructional approach, or choice of strategy, they afford students the expectation or hope that things can be different in the future. Teachers can foster student beliefs that their intelligence and ability can be developed through effort and by applying different strategies:

- Positive messages about people with disabilities (or other demographic groups to which students belong), and self-affirming activities, may help counteract students' negative self-perceptions due to stereotypes about factors such as their race or disability status, and may in turn increase academic performance.
- Positive role models that students can relate to, such as those from their own race/ethnicity, gender, or disability status, can also help improve student self-perceptions and elevate their goals.
- Teachers can convey that failure at any given task is not due to lack of ability but rather that performance can be enhanced, particularly with added effort or through the use of different strategies. Attributing failure to low ability often leads students to give up when they encounter failure. Hence, when students believe their performance can be improved, they are fostering

a growth mind-set that can bring motivation and persistence to bear on challenging problems or material.

- Teachers should avoid generating ability-based attributions when a task is moderately easy. For example, when teachers praise a student by saying “You’re so smart” after the student has finished a task or quickly solved a relatively unchallenging problem, the teacher may inadvertently encourage the student to associate smartness with speed and lack of effort. These associations become problematic when the student is later presented with more challenging material or tasks that require more time and effort, because the student may assume that the feeling of being challenged is related to a lack of talent or ability.
- Teachers need to be judicious in their use of praise, making sure the content of praise is tied to effort or successful strategies and not ability. Indirect and subtle cues about low ability can be unintentionally communicated by teachers, especially when they are attempting to protect the self-esteem of failure-prone students. For example, offering praise for success on a relatively easy task may not be reassuring or reinforcing to the student. In fact, such praise may undermine motivation because it suggests a student does not have the ability to succeed at a more difficult task (e.g., “Why is my teacher praising me for getting these easy problems right?”).
- When presenting students with challenging materials and tasks, teachers may want to be aware of situations in which students expend minimal, modest, or incomplete effort. This lower level of effort may reflect a student’s fear of embarrassment or failure (“If I don’t even try, people will not think I’m dumb if I fail”).
- Unsolicited offers of help by a teacher, especially when other students do not receive help, and sympathetic affect from a teacher following student failure can be interpreted by students as indirect and subtle cues about low ability. When teachers consistently offer help to all students and communicate mild and constructive criticism following failure, students are more likely to attribute their failure to lack of effort and to believe teachers’ expressions of high expectations that they will do better in the future.
- Teachers can invite conversations with family members and students to better understand contextual and cultural factors of intelligence and its impact on potential for learning.

To be clear, we are not suggesting that teachers should never praise or help their students, or that they should always express disappointment (rather than sympathy) or offer constructive criticism (rather than compliments). Best practices may vary based on the emotional state and ability level of a student. Some students have disabilities that may not be immediately apparent. Although students should be encouraged to work hard, suggesting that a student need only put in more effort to accomplish a difficult task, if the student is already putting in maximum effort, may inadvertently highlight limitations in ability. Such feedback can lead to negative self-perceptions about disabilities and worries that the teacher believes the student is lazy. Therefore, the appropriateness of any feedback will depend on many factors based on teacher judgment of the situation. The general message is that attribution principles, which are intricately linked to mind-set, help explain how some well-intentioned teacher behaviors may have unexpected, or even negative, effects on students’ beliefs about their own abilities. The good news is that teachers can also have positive impacts on student mindsets.

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PRINCIPLE 2 What students already know affects their learning.

EXPLANATION

Students come to classrooms with preconceived knowledge based on their everyday experiences, social interactions, intuitions, and what they have been taught in other settings and in the past. For example, students vary not only in cultural knowledge, but also knowledge of facts, general academic knowledge in areas such as science, and prior knowledge of key vocabulary words related to specific topics. Students with some disabilities may have gaps in academic knowledge and may activate existing knowledge at a slower pace. For example, students who are blind may not have background knowledge that is typically acquired solely through visual observation but may have other types of knowledge not known by their sighted peers.

Prior knowledge, in and out of the classroom, affects how students incorporate new learning because what they already know interacts with the material being learned. Thus, their knowledge representations continuously shift during learning, making knowledge a key malleable factor in students' education. Prior knowledge is also related to how students use reasoning to form connections across different ideas and from different sources. Accordingly, learning consists of either adding to existing student knowledge, known as **conceptual growth**, or transforming or revising student knowledge, known as **conceptual change**. Learning

as conceptual growth occurs when student knowledge is consistent with material to be learned, providing leverage for understanding less familiar, but related topics. Teachers can help students reason from familiar to unfamiliar topics by analogy when a student's familiar knowledge has been activated. However, not all students are skilled at activating their prior knowledge and teachers can also play a key role in helping them activate knowledge and leverage it for learning. Students with disabilities generally require additional time to assimilate new concepts and knowledge.

Conceptual change is required when student knowledge is inconsistent or erroneous with respect to correct information. In these cases, students' knowledge consists of "misconceptions" or "alternative conceptions." Many common misconceptions are held by both students and adults, particularly in subjects such as mathematics and science. Teachers can gain an understanding of students' current understanding of a specific subject area by administering an initial assessment of student knowledge prior to instruction on a topic, for example, by discussing prior knowledge and experiences, and giving students a problem to think through. This type of assessment, called formative assessment, can be used as a type of a pretest or as a baseline for student knowledge and for monitoring conceptual growth and change. Through careful observation, teachers are able to see how their students assimilate and accommodate new information in the place of their misconceptions.

When the baseline assessment shows that students are harboring misconceptions, learning will require conceptual change—that is, revision or transformation of student knowledge because their prior knowledge interferes with learning. Achieving conceptual change in students is far more challenging for teachers than inducing conceptual growth because misconceptions tend to be entrenched in reasoning and resistant to change. Students, like anyone, can be very reluctant to alter their thinking since it is familiar to them. Also, students are generally unaware that their concepts are erroneous and hence believe them to be correct. Alerting students to the fact that the new information may not align with their prior knowledge may be particularly helpful, for example, by debunking popular misconceptions. Learning will take place over time when the incorrect knowledge is revised with new knowledge that is encountered in the textbooks and in the classroom.

RELEVANCE FOR TEACHERS

Teachers can be instrumental in achieving both conceptual growth and conceptual change in a targeted manner:

- Provide linguistic supports (glossary of key terms) and accessible instructional materials (e.g., audio books, assistive technology to support reading like screen readers) for students with disabilities that impact language and reading print. This is particularly important as students move from ‘learning to read’ to ‘reading to learn’ because background knowledge is acquired through reading and students who struggle to read may fall further behind in background knowledge.
- When the baseline assessment shows students’ current knowledge to be consistent with the curricular concepts to be taught, teachers can facilitate conceptual growth by engaging students in meaningful, thoughtful interaction with the information to be learned.
- When considering why students were unsuccessful, teachers should encourage students to reflect on what worked and how to advocate for accommodations and tools they need to succeed (e.g., text to speech or tactile drawings). The reflection should focus on how to change their learning environment rather than negative attributes about the student.
- Teachers can consider capturing non-verbal growth and change rather than the focus on verbal growth and change when appropriate.
- Simply telling students they need to think differently or using teaching strategies for inducing conceptual growth will generally not lead to substantial change in student thinking. Bringing about conceptual change requires teachers’ use of specific instructional strategies. Many of these entail methods that precipitate cognitive conflict or dissonance in the minds of students by helping make them aware of the discrepancy between their own thinking and correct curricular material or concepts. Teachers need to value students’ ideas, determine where students’ misconceptions are, and link those ideas by reconciling new information with previous ones. This can be accomplished by following the phases in the 5E model (Engage, Explore, Explain, Elaborate, and Evaluate).
- To identify areas of misconception, teachers can **engage** their students in activities that tap into their curiosity and increase their interest in the topic by asking questions, defining, summarizing, synthesizing, applying concepts, and participating in hands-on activities. This

step is equivalent to conducting a formative assessment to establish a baseline.

1. Teachers can foster concrete learning experiences by asking students to **explore** the new learning concepts by engaging in peer interaction tasks. Teachers can also have students play an active role in predicting solutions or processes and then show these predictions to be faulty. When possible, teachers can pair students with special needs with their non-disabled classmates to better identify areas of misconception.
2. To help students accommodate the new information, teachers can provide opportunities for students to ask questions and to **explain** concepts and provide further clarifications. Teachers can present students with credible information or data that run counter to their misconceptions. They can also use videos or computer programs to help increase learning. Using various learning tools can be particularly useful for students with disabilities.
3. Teachers can provide opportunities for students to **elaborate** what they’ve learned. This can be accomplished by writing about, creating presentations, and reviewing concepts that students had learned in the explore and explain phases.
4. Teachers can **evaluate** students’ learning by conducting formal and informal assessments. Such assessments may include self- and peer-assessments, writing assessments, formal quizzes, and exams.

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PRINCIPLE 3 Students' cognitive development and learning are not limited by general stages of development.

EXPLANATION

Student reasoning is not limited or determined by an underlying cognitive development stage linked to an age or a grade level. Instead, newer research on cognitive development has supplanted these stage theory accounts. Infants have been found to have early, possibly native (biologically based), competencies in certain domains. For example, children can show knowledge of principles related to the physical world (e.g., that stationary objects are displaced when they come into contact with moving objects or that inanimate objects need to be propelled into motion), biological causality (e.g., animate and inanimate entities

differ), and numbers/numeracy (e.g., an understanding of numerical values up to three items). Studies of cognitive development and learning that emphasize the background knowledge or knowledge base of students reveal that they have many structures in place. For example, structures, known as schemas (i.e., mental representations) guide students' understanding when encountering text and events.

Contextualist approaches to cognitive development and learning describe how context affects cognition (e.g., social, emotional, family, cultural norms, and expectations). Advocates of cognitive approaches point out that cognition can be interpersonally based, such that student reasoning can be facilitated to more advanced levels when students interact with more capable others and/ or with more advanced materials. This strategy is especially effective when materials are pitched not too near or too far from students' current level of functioning. This principle is captured in what is called the zone of proximal development. A task lying within the proximal development zone can be defined as a task that students cannot solve themselves but can solve with assistance. This concept is particularly important for students with cognitive disabilities who are in classrooms with grade level peers (as the least restrictive environment) but require instruction to be scaffolded closer to the students' current achievement level. It is also important to remember that students with disabilities are likely to have patterns of strengths and weaknesses that may not follow typical patterns across all domains (e.g., decoding, speaking, listening comprehension).

Contextualist approaches also support the idea that cognition can be “situated,” whereby knowledge accrues through the lived practice of people in a society. That is, learning is conceived as participation in communities, with students progressively acquiring situated actions (such as farming, learning a craft, or adapting to societal expectations). Formal schooling can be viewed as a practice. In sum, students are capable of higher-level thinking and behavior when (a) there is some biological base (early competency) for knowledge in the domain, (b) they already have some familiarity or expertise with a knowledge domain, (c) they interact with more capable others or challenging materials, and (d) in sociocultural contexts with which they are familiar through experience. Conversely, when students are not familiar with a particular knowledge domain, they are not challenged by the interpersonal context or learning materials, or find the context of learning to be unfamiliar, their reasoning may become less sophisticated.

RELEVANCE FOR TEACHERS

Teachers' estimation of what material should be presented, and the method of presentation are more effective when they can consider the domain-relevant and contextual knowledge of their students. Baseline assessments can be used to assess this knowledge, and the results can be very informative for instructional design. Students' developmental levels can help teachers decide which instructional experiences might be appropriate and relevant, but age, whether chronicle or mental, should not necessarily be viewed as the primary or sole determinant of what a student is capable of knowing or reasoning.

For students in special education it is also important to ensure that the curriculum is aligned to grade level expectations (or in some cases alternate grade level expectations) to allow for learning in a community with grade based peers. In designing instruction, teachers can facilitate student reasoning by the following:

- When selecting instructional materials and assessments avoid the use of 'off grade level' content (e.g., story about baby dolls for a high school student with intellectual disabilities rather than adapting *Romeo and Juliet* to an appropriate level for the student's zone of proximal development
- Encouraging students' reasoning in familiar areas—that is, in knowledge domains and contexts in which students already have substantial knowledge. For example, students are able to comprehend reading material at a higher level and are able to write with greater sophistication when they have substantial knowledge relevant to the topic of the reading or writing assignment.
- Presenting topics and domains pitched at a moderate distance ahead of students' current level of functioning. Providing information that is not too elementary to be easily understood and not too complex to be out of range of understanding, even with assistance, represents the perfect level of entry for new material. If a topic is unfamiliar, teachers may want to link that topic to what students already know to foster more advanced levels of reasoning.
- Giving assignments that can be performed with the assistance of more experienced students or teachers.
- Using heterogeneous groupings, whereby students are placed in mixed-ability groups to allow for interaction with higher-level thinkers in learning and problem solving.
- Helping students already at very high levels of functioning achieve even higher levels by facilitating their interaction with still more advanced peers or with instructors and by using advanced learning materials (as noted in the third bulleted entry above).
- Teachers can gain information from family members regarding contextual knowledge that might aid in understanding students' out-of-the classroom contextual cognitive functioning and learning.

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PRINCIPLE 4 Learning is based on context, so generalizing learning to new contexts is not spontaneous but instead needs to be facilitated

EXPLANATION

Learning occurs in context. Contexts can consist of subject-matter domains (e.g., science), specific tasks/problems (e.g., a textbook problem to solve), social interactions (e.g., caretaking routines between a parent and child), and situational/physical settings (e.g., home, classrooms, museums, labs). Hence, for learning to be more effective or powerful, it needs to generalize to new contexts and situations. Furthermore, students with special education needs can have strengths in one context but not another. Student transfer or generalization of their knowledge and skills is not spontaneous or automatic; it becomes progressively more difficult the more dissimilar the new context is from the original learning context. In addition, it is not only the transfer of knowledge and skills as an end product that needs particular attention, but the process of attainment of the knowledge and skills that is crucial for children with special needs. Notably, transfer or generalization of student knowledge can be facilitated and supported, acknowledging that all children are unique and have diverse learning strengths and challenges. Moreover, students' ability to transfer learning is an important indicator of the quality of their learning—its depth, adaptability, and flexibility.

RELEVANCE FOR TEACHERS

Teachers can support student transfer of knowledge and skills across contexts—from highly similar to highly dissimilar. This is best done by the following:

- Identify from the IEP team, parents, and caregivers which contexts tend to elicit strengths as a starting point for contexts that are more challenging. Pairing a context of strength with a context of challenge can provide a foundation for a next teaching step.
- Consult with the IEP team, parents and caregivers for appropriate goal-setting, breakdown of learning steps, and strategies over time that work before introducing new methodologies and concepts.
- Build on strengths that students bring to a learning situation thereby making connections between students'

current knowledge and skills and the teachers' learning goals.

- Teaching a topic or concept in multiple contexts and breaking the topic and concepts in smaller steps based on the student's learning situation.
- Acknowledge that each student with some disabilities might need sensory input and support to be successful in learning about multiple contexts.
- Applying the process and product of a strong context to another context that a student might find more challenging.
- Recruit feedback from parents and caregivers on how context areas can be further understood using real-world, applied examples from the student's world and/or the method that might be helpful for optimal learning.
- Helping students see the application of their knowledge to the real world (e.g., using multiplication and division to understand the cost of purchases in a store) or assisting them in transferring real-world knowledge when trying to understand academic principles. Teachers can provide occasions and multiple contexts in which students can use and practice their knowledge. For example, students may not spontaneously recognize the relevance of their learning about solving division problems unless it is applied to computing gas mileage in a real-world context. Teachers can help students generalize/apply their knowledge by regularly providing real-life instances of the academic behaviors in which they are engaged.

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PRINCIPLE 5 Acquiring long-term knowledge and skill is largely dependent on practice

EXPLANATION

What people know (their knowledge base) is inscribed in long-term memory. Most information, particularly when related to academic content and highly skilled activities (e.g., sports; artistic endeavors such as playing a musical instrument), must be processed in some way before being stored in long-term memory. At any given moment, students experience an enormous number of stimuli in the environment, but only a small portion is further processed in the form of attention and encoding, ultimately moving into a time-constrained and limited-capacity memory storage area known as short-term or working memory. To be retained more permanently, information must be transferred into long-term memory, which by definition is of relatively long duration (e.g., decades), has very large capacity, and is highly organized (e.g., categorized). The transfer of information from short term to long-term memory is accomplished through different strategies, and practice is key to this transfer process.

Studies comparing the performance of experts and novices have uncovered important distinctions between deliberate practice and other activities, such as play or “drill and kill” repetition. Rote repetition—simply repeating a task—will not by itself improve performance or long-term retention of content. Instead, deliberate practice involves attention, rehearsal, and repetition over time and leads to new knowledge or skills that can later be developed into more complex knowledge and skills. Although other factors such as intelligence and motivation also affect performance, practice and rehearsal are necessary, if not sufficient, activities for acquiring expertise.

Overall, learning is improved in at least five ways through rehearsal and deliberate practice. Evidence demonstrates that (a) the likelihood that learning will be long term and retrievable is increased, (b) student ability to apply elements of knowledge automatically and without reflection is enhanced, (c) skills that become automatic free up students’ cognitive resources for learning more challenging tasks, (d) transfer of practiced skills to new and more complex problems is increased, and (e) gains often bring about motivation for more learning.

RELEVANCE FOR TEACHERS

Student practice can be elicited and encouraged by teachers in a variety of ways. Because practice requires intense, focused effort, students may not find it inherently enjoyable; therefore, teachers need to encourage students to practice by pointing out that expending effort leads to improved performance.

Teachers can motivate students to engage in practice by expressing confidence in their ability to do well in solving practice problems and by designing activities that maximize students’ opportunities to succeed. Unrealistic or poorly designed practice problems may lead to student frustration and less motivation to attempt future practice problems. Tests (or quizzes) that are given immediately after a learning exercise give students opportunities to practice, and they tend to do well because the learning is recent. However, their success in this case does not ensure long-term retention. Effective methods of implementing practice in the classroom include:

- Using reviews and tests (practice testing). The value of testing or any kind of practice exercise is enhanced by conducting them at spaced intervals (distributive practice) and giving them frequently. Brief tests with open-ended questions are particularly effective because they require that students not only recall information from long-term memory but also generate new information from that retrieval.
- Providing students with a schedule of repeated opportunities (interleaved practice) to rehearse and transfer skills or content by practicing with tasks that are similar to the target task or using several methods to approach the same task.
- Designing tasks with students’ existing knowledge in mind (see Principle 2).

- Ensure student learning is reinforced during extended school breaks. For example, consider summer instruction that allows for practice and retrieval of skills learned during the school year.
- Teachers can provide family members concrete examples and activities to set test-taking expectations and to practice at home.

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PRINCIPLE 6 Clear, explanatory, and timely feedback to students is important for learning

EXPLANATION

Learning can be increased when students receive regular, specific, explanatory, and timely feedback on their work. Feedback that is occasional and perfunctory (e.g., saying “good job”) is neither clear nor explanatory and does not increase student motivation or understanding. Feedback is most effective for students with disabilities when it describes the gap between their current performance and the goal for their desired performance and provides cues for how to close that gap. Prompt and effective feedback together with clear goals for learning can help students with disabilities to stay on track in their learning.

RELEVANCE FOR TEACHERS

- Effective feedback is a powerful instructional strategy for students with disabilities. It is most effectively useful when it is prompt rather than delayed, describes specific actions that students can take to improve their future performance, and is accompanied by reinforcement for ‘closing the gap’ between students’ current performance and their ‘hoped for’ performance.
- Feedback can be accompanied by relevant learning goals that tell students what they are (or are not) understanding and the strength of their performance. Although teacher-set goals are as effective as student set goals in strengthening student learning, it is ultimately important that students with disabilities participate in and learn to set personal goals for their learning.
- Feedback is even more effective when it describes what students can do in the future to achieve those goals. For example, rather than general remarks, such as “nice work” or “you do not appear to be getting this,” teachers can make more directed comments, such as “You completed 10 of the 12 problems correctly. In the future, you also need to check your answers to each problem and find any mistakes that you have made.”

- It is useful to provide students with disabilities with guided practice in strategies that they can use to improve their work and reach their goals. Strategies such as ‘checking their work’ or ‘reading instructions carefully’ can be taught by describing what to do, modeling the strategy with a piece of work examples, and observing the student practicing the strategy while praising their correct use of the strategy, and redirecting any mistakes they make when practicing the strategy.
- Progress monitoring feedback helps students with disabilities understand changes over time in their success towards meeting important learning goals. For example, teachers can explain, “Last week you wrote 15 words for your daily essay, and the week before you only wrote 8 words. Today, you wrote 24 words.” Teachers can describe students’ progress verbally, or with graphs or charts. These descriptions help students with disabilities recognize their strengths and gain confidence in their ability to achieve important learning goals.
- Immediate feedback on quizzes and practice tests is helpful to students and appears to improve classroom performance in the future. Examples of such feedback include providing the correct response when students answer incorrectly or, alternatively, providing guidance that helps students discover the correct response themselves.
- Providing feedback in a timely way (e.g., as quickly as possible after a quiz) assists learning and is usually more effective than providing delayed feedback.
- The tone and targeting of feedback affect student motivation. Students respond better if feedback describes positive details of their performance and addresses aspects of their work that are very relevant to their learning goals. In contrast, students may dismiss or be upset by feedback that is negative in tone and focuses excessively on less relevant details of student performance. Elicit feedback from family members of what works in positive feedback strategies for their child that can be implemented in school.
- When students are learning a new task or struggling with an existing one, frequent praise following small degrees of improvement is very important, and when progress is evident, encouragement to persist can matter a great deal. Targeted feedback can also motivate students to continue to practice learning a new skill (see Principle 5).

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PRINCIPLE 7 Students’ self-regulation assists learning, and self-regulatory skills can be taught

EXPLANATION

Self-regulatory (or executive function) skills, including attention, organization, self-control, planning, and memory strategies, enable students to learn efficiently and effectively. This principle is particularly important for teachers of special education students because many the diagnostic criteria for common disabilities include self-regulatory skills (e.g., inattention and impulse control are criteria for ADHD). These skills allow students to arrive prepared, follow instructions, attend to the teacher, and ignore distractions. Although these skills develop over time, they can be taught or enhanced through direct instruction, modeling, support, and classroom organization and structure. During instruction, prompts, graphic organizers, checklists and guides are useful tools to enhance students’ capacities for self-regulation.

RELEVANCE FOR TEACHERS

Teachers can help students learn self-regulatory skills by introducing teaching strategies to enhance attention, organization, self-control, planning, and remembering, all of which can greatly facilitate learning. The classroom environment itself can also be organized to enhance self-regulation. Organizational assistance can be provided in several ways:

- Teachers can post and discuss the daily schedule each day, even if it remains similar throughout the week.
- Teachers can review classroom expectations throughout each school day, especially when expectations change (e.g., calling out vs. raising hand).
- They can break down tasks into smaller, “chunks” and clearly spell out the criteria for successful task performance. For example, teachers may provide one page of a multi-page worksheet at a time to avoid students becoming overwhelmed.
- Teachers can provide students some autonomy and allow students to make limited decisions (e.g., “Do you want to start with your math worksheet or your silent reading during morning seatwork time?” or “Will it be more helpful for you to write out your report or to dictate it into the computer’s text-to-speech app?”)
- Teachers can provide time and opportunities for students to engage in practice.
- Some processing time and activity (e.g., summarizing, questioning, rehearsing, and practice) are necessary for long-term remembering.
- Teachers can help students plan by helping them identify and evaluate short- and long-term goals for performance or consequences to their decisions.
- Goals will be more meaningful when students are coached to periodically revisit the goal, determine whether or not they have met it, and decide what they will do next to increase their performance.
- Teachers can explicitly train notetaking and organizational strategies or systems.
- To increase student attention, teachers can use cues to alert students that important information will follow, especially when introducing a new concept.
- Teachers can limit classroom distractions (e.g., place toys in a cupboard or behind curtain).
- Teachers can gain additional strategies from family members of what works in the home environment that might be used within the school setting.

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PRINCIPLE 8 Student creativity can be fostered.

EXPLANATION

Creativity is defined as the generation of ideas, products, or processes that are new and useful in a particular situation. The creative process includes being able to identify problems, generate potential solutions, evaluate the effectiveness of those strategies, and then communicate with others about the value of the solutions. These skills are all highly relevant to educational success, workforce effectiveness, and quality of life. Contrary to the conventional wisdom that creativity is a stable trait (you either have it or you don’t), creative

thinking can be enhanced and nurtured in all students, making it an important outcome of the learning process for students and educators. Another common misconception is that certain disabilities might preclude creative expression; in fact, creative solutions to various challenges can be demonstrated by any student. Moreover, creative approaches to teaching can inspire enthusiasm and joy in the learning process by increasing student engagement and modeling real-world applications of knowledge across domains.

RELEVANCE FOR TEACHERS

A variety of strategies are available for teachers to establish classroom environments that are conducive to creative thinking in students:

- Educators can allow for a wide range of student approaches to completing tasks and solving problems, as the strategies being taught may not be the only ways to answer a specific question, solve a particular problem, or address the challenge at hand.
- Teachers can encourage openness to diverse perspectives during discussions, reinforcing that perspectives from all students are clearly valued and welcomed in the classroom.
- Teachers can orchestrate special classroom activities where rules are allowed to be broken or students can generate their own rules. Such activities might give students opportunities to experience creativity and teach them how to cope with novel and unexpected challenges.
- Teachers should be aware that highly creative students are often seen as disruptive; however, student enthusiasm can be channeled into solving real-world problems or taking leadership roles on certain tasks.
- Teachers should model creativity. Teachers are powerful models, and as such they should share with students their own creativity—including the use of multiple strategies to solve problems across various aspects of their lives.
- Teachers can involve students in planning “teaching for creativity.” Through apprenticeship, students may develop their own definitions of creativity and learn to recognize novelty and innovation. They may also develop an improved sense of judgment as to when it is appropriate to focus on getting one right answer and when to pursue alternative approaches.
- Teachers should explicitly encourage students to be creative and recognize their creative efforts with praise.

The creative process is often misconstrued as being purely spontaneous or even frivolous, yet extensive research provides evidence that creativity and innovation are the result of focused thinking and systematic practice. For this reason, other instructional approaches that can foster creativity include:

- Varying activities by including prompts in assignments, such as *create, invent, discover, device, design, imagine, pretend, fantasize, synthesize, formulate, hypothesize, construct, and predict*.
- Using methods that focus on questioning, challenging prevailing beliefs, making unusual connections, envisioning radical alternatives, exposing students to novel and unexpected situations, and critically exploring ideas and options.
- Providing opportunities for students to solve problems in groups and communicate their creative ideas to a wide range of audiences (peers, teachers, family, and community members).
- Providing a wide range of materials (including new technology tools) for creative practice in different domains by children across a broad range of capabilities.

Creativity is not the same as talent, IQ, or academic achievement. Creative products are often unexpected or surprising. To recognize creativity, teachers might keep in mind that:

- Creativity may be expressed in divergent (“outside the box”) or original ideas focused on a particular problem, or in the quantity of solutions that can be devised by a student, even if some of these solutions are not practical or possible.
- Students who face challenges to learning in typical classrooms may come up with their own creative solutions to work around barriers to learning.
- There are a number of formal (standardized and otherwise) assessments for creativity that may be useful for the identification of creative ability in children who have special needs.

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What motivates students?

PRINCIPLE 9 Students tend to enjoy learning and to do better when they are more intrinsically rather than extrinsically motivated to achieve

EXPLANATION

Intrinsic motivation refers to engaging in an activity for its own sake. To be intrinsically motivated means to feel both competent and autonomous (e.g., “I can do it for myself”). Students who are intrinsically motivated work on tasks because they find them enjoyable. In other words, participation is its own reward and is not contingent on tangible rewards such as praise, grades, or other external factors. In contrast, students who are extrinsically motivated engage in learning tasks as a means to an end, such as to get a good grade, to get praise from their parents, or to avoid punishment. All students including those with disabilities benefit from being intrinsically motivated when engaging in academic tasks. It is not the case that intrinsic and extrinsic motivation are at opposite ends of a motivation continuum, such that having more of one means having less of the other. Instead, students engage in academic tasks for both intrinsic and extrinsic reasons (e.g., because they enjoy it and to get a good grade). Nonetheless, intrinsically motivated task engagement is not only more enjoyable, it is positively related to more enduring learning, achievement, and perceived competence. Intrinsic motivation is also negatively related to test anxiety.

These benefits occur because students who are intrinsically motivated are more likely to approach tasks in ways that enhance learning, such as attending more closely to instruction, organizing new information effectively, and relating that information to what they already know. They also feel more self-efficacious and are not burdened by achievement anxiety. On the other hand, students who are more extrinsically motivated may be so focused on the reward (e.g., getting a high grade) that learning is superficial (e.g., the student may resort to shortcuts such as skimming

the reading for specific terms rather than absorbing the entire lesson), or they may become discouraged if the pressures are too high. Furthermore, externally motivated students may disengage once the external rewards are no longer provided, whereas intrinsically motivated students show more long-lived mastery of learning goals.

Notably, however, a substantial body of experimental research studies shows that extrinsic motivation, when properly used, is very important to producing positive educational outcomes. Research also shows that students develop academic competence when they do tasks repeatedly in carefully constructed ways so that the basic skills become automatic. As more basic skills become automatic, the tasks require less effort and are more enjoyable. Just as in sports, students improve their reading, writing, and mathematics skills when they do these activities repeatedly with teacher guidance and feedback, gradually progressing from less complex tasks to more difficult ones. Students’ engagement in these activities often requires teacher encouragement and praise for making progress. As students develop increasing competence, the knowledge and skills that have been developed provide a foundation to support the more complex tasks, which become less effortful and more enjoyable. When students have reached this point, learning often becomes its own intrinsic reward. Extrinsic motivation is especially important for students with special needs as they are more likely to struggle academically and more likely require academic support.

RELEVANCE FOR TEACHERS

Promoting intrinsic motivation requires the incorporation of practices and activities that support students’ fundamental need to feel competent and autonomous:

- When using grades, teachers might want to highlight their informational (feedback) rather than controlling (rewarding/punishing) function.
- A useful strategy when using any external constraints such as deadlines is to think about whether the constraints will be perceived by students as too

controlling. Much of the perception of control can be managed by the way in which a task is communicated to students.

- Psychological research has shown that instruction in a preferred learning style does NOT lead to greater learning. However, students with disabilities do have unique learning needs so providing some ‘choice’ in how students learn (e.g., watching video vs reading a book) may increase intrinsic motivation. The *Universal Design for Learning* framework can provide some ideas on how to allow for student choices (autonomy) to foster intrinsic motivation.
- Autonomy needs are more likely to be satisfied when students have choices. Allowing students to select from an array of achievement activities and to have a role in establishing rules and procedures helps foster perceptions of autonomy. This approach can also help students learn the value of choosing tasks that are of intermediate difficulty for them. Tasks are optimally challenging when they are neither too easy nor too hard. Choice is most effective when the choices themselves match students’ needs, goals, and resources.
- Because intrinsic motivation involves enjoying a task for its own sake, teachers might want to incorporate the ideas presented for Principle 8 on creativity, so as to introduce novelty by providing some level of surprise or incongruity and allowing for creative problem solving. Teachers should foster collaborative work and a sense of community amongst their students. More academically advanced students can provide mentoring and intellectual, social, and emotional support to any of their peers, but can be particularly supportive of peers with disabilities.
- Supporting students’ intrinsic motivation to achieve does not mean that teachers should eliminate the use of rewards. Certain tasks in the classroom and in life, like practicing new skills, might be inherently uninteresting to students. It is important to teach students that some tasks, even tasks that are necessary to master, might be uninteresting at first yet require consistent, sometimes tedious, engagement for learning. Once learned, new skills may become their own reward.

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PRINCIPLE 10 Students persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals

EXPLANATION

Goals are the rationale for why students engage in particular learning activities. Researchers have identified two broad types of goals: mastery goals and performance goals. Mastery goals are oriented toward acquiring new skills or improving levels of competence. Students who hold mastery goals are motivated to learn new skills or achieve mastery in a content area or on a task for intrinsic reasons. In contrast,

students who adopt performance goals are motivated to demonstrate that they have adequate ability (performance-approach goal orientation) or to avoid tasks in an effort to conceal a perception of having low ability (performance-avoidance goal orientation). According to this analysis, individuals can engage in achievement activities for two very different reasons: They may strive to develop competence by learning as much as they can (mastery goals), or they may strive to display their competence by trying to outperform others (performance goals).

Holding performance goals can lead students to avoiding challenges if they are overly concerned about performing as well as other students. In typical classroom situations, when students encounter challenging materials, mastery goals are generally more useful than performance goals. Though the findings are somewhat mixed, some research suggests that while students with learning disabilities benefit from the mastery approach to goals, they tend to be less likely to hold a mastery goal orientation. This may be due to their experiences of academic struggle and lower achievement, making early identification and intervention even more important for students with disabilities.

RELEVANCE FOR TEACHERS

There are specific ways in which teachers can organize instruction to foster mastery goals:

- Try to emphasize individual effort, current progress over past performance, and improvement when evaluating student work rather than rely on normative standards and comparison with others.
- In classroom settings, student evaluations are best delivered privately.
- Praise like “perfect,” “brilliant,” and “amazing” that provides no specific information to the student about what was done so well is best avoided because it does not promote guidance for replicating high-quality work.
- It is best to avoid social comparisons. Whereas high-achieving students may sometimes enjoy public recognition of their accomplishments and should be praised when their level of achievement exceeds previous personal levels, those who are struggling or who worry about appearing “dumb” can be discouraged by social comparisons. Instead, teachers could consider the progress each student has made on his or her individual work in a manner that does not compare one student’s work to another.

- Students with learning disabilities may experience more anxiety around failure which could lead them to avoid situations in which failure is likely to occur. Treat failures as formative learning experiences, so they are not perceived as indicating a lack of ability. Encourage students to see mistakes or wrong answers as opportunities to learn rather than as sources of evaluation or evidence of ability. If teachers focus too much attention (through praise) on perfect scores and make mistakes too visible (e.g., red marks on students’ papers), students can come to devalue mistakes and be reluctant to view them as a natural part of learning. Students with learning disabilities may experience more anxiety around failure, which could lead them to avoid experiencing situations in which failure is likely to occur.
- Individualize the pacing of instruction as much as possible. Some students take longer to master the material than others and should be given that extra time. Allowing students a role in setting timelines for completing tasks and monitoring their own progress helps them focus on process (acquiring mastery) in addition to the outcome (performance).
- Some students with disabilities may overestimate their own competence. Providing scaffolding to help students better monitor their knowledge and skill level can help them regulate their learning more appropriately, and monitor how their knowledge and skills are improving with practice. This scaffolding may mitigate disappointment from poorer than expected performance.
- Providing guidance about specific task processes will provide special education and lower ability students with scaffolding to enact the more complex learning strategies that characterize mastery.
- Students with disabilities tend to attribute success and failure to factors outside of their control, rather than to their own allocation of effort. This can lead to a devaluing of the academic domains in which they are challenged.

It is important to consider the context of different environments when planning for learning and motivation in classroom settings. Teachers provide cues to their students about what they believe about learning and performance goals through the instructional environments they cultivate:

- Organizing instructional activities that allow students to work cooperatively in small mixed-ability groups can downplay ability differences between students and

encourage them to develop as a community of learners. Cooperation is one of the best ways to promote a mastery goal orientation.

- Rather than using cooperation and competition as incompatible learning tools in the classroom, teachers could sometimes use teams of mixed-ability groups that compete with each other to reach a common goal.
- There are times when performance goals can work well in situations that are themselves a performance. These situations may be more competitive, such as a science fair where students are organized into teams and given the task of designing a robot, machine, or other device that will then be entered into competition for reward or recognition.

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PRINCIPLE 11 Teachers' expectations about their students affect students' opportunities to learn, their motivation, and their learning outcomes

EXPLANATION

Teachers often hold expectations about the abilities of their students. These beliefs shape the kinds of instruction delivered to students, the type of feedback provided to students, the grouping practices that are used, anticipated learning outcomes, and methods of evaluation. Most teacher expectations about individual student ability are based on students' past academic performance and, for the most part, may be an accurate representation. In some cases, however, teachers come to hold inaccurate beliefs, such as expecting less of the student than he or she can actually achieve. Teachers have been shown to have different expectations for students with disabilities, and these differential expectations can increase based on the severity of the disability. If faulty expectations are communicated to a student (whether verbally or nonverbally), that student may begin to perform in ways that confirm the teacher's faulty expectation. An inaccurate teacher expectation that creates its own reality has been labeled a self-fulfilling prophecy. When these inaccurate expectations do occur, they are more likely to be directed toward stigmatized groups (e.g., students identified with a disability, ethnic minority youth, economically disadvantaged youth), because negative beliefs or stereotypes about the intellectual abilities of these groups exist in our society.

These faulty expectations are more likely to occur in the earlier grades, at the beginning of a school year, and at times of school transitions—in other words, when the contexts in which information about prior achievement may be least available or reliable and when students may have grounds to question their abilities. Whether accurate or not, expectations influence how teachers treat students. For example, teachers appear to provide a more supportive emotional climate, clearer feedback, more attention, more instructional time, and more learning opportunities overall for their high-expectancy versus low-expectancy students. Such differential treatment may increase the actual differences in achievement between high- and low-performing students over time.

RELEVANCE FOR TEACHERS

It is best for teachers to communicate high expectations to all students and maintain appropriately high standards for everyone in order to avoid negative self-fulfilling prophecies:

- High expectations are conveyed when students with disabilities are placed in the least restrictive environment with adequate supports. When considering student placement options, consider how placement will implicitly communicate high expectations.
- Teachers can continually assess the reliability of the information they are using to form their expectations. A student's weak academic history should not be perceived as the absolute last word about a student (i.e., there may be mitigating factors that may have impaired the student's ability in the past but no longer apply) but rather as a working hypothesis about a student that the teacher has an opportunity to disprove. Also, disability status, race, gender, and social class are not solid bases on which to form expectations of student ability.
- Because teachers can sometimes be unaware that they are treating students differently on the basis of their expectations (high-expectancy students vs. low-expectancy students), it can be helpful for teachers to do a self-check. For example, teachers can ask themselves whether (a) only high-expectancy students are seated in the front of the classroom, (b) everyone is getting a chance to participate in class discussions, and (c) written feedback on assignments is comparably detailed for high- and low-expectancy students.
- When determining which assessments will be given, avoid selecting 'off grade level' assessments that convey low expectations. Instead select adaptive assessments that measure both grade-based expectations and current achievement levels.

Probably the best antidote to negative expectancy effects is to never give up on a student.

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PRINCIPLE 12 Setting goals that are short term (proximal), specific, and moderately challenging enhances motivation more than establishing goals that are long term (distal), general, and overly challenging.

EXPLANATION

Goal setting is the process by which a person establishes a standard of performance (e.g., "I want to learn 10 new words every day"; "I want to graduate from high school in 4 years"). This process is important for motivation because students with a goal and adequate self-efficacy are likely to engage in the activities that lead to attainment of that goal. Self-efficacy is also increased as students monitor the

progress they are making toward their goals, especially when they are acquiring new skills in the process.

Three properties of goal setting are important for motivation. First, short-term, or proximal, goals are more motivating than long-term, or distal, goals because it is easier to judge progress toward proximal goals. Developmentally, at least until middle adolescence, students tend to be less skilled at thinking concretely about the distant future. Second, specific goals (e.g., “I will finish 20 addition facts today with 100% accuracy”), are preferable to more general goals (e.g., “I will try to do my best”) because they are easier to quantify and monitor. Third, moderately difficult goals rather than very hard or very easy goals are the most likely to motivate students because moderately difficult goals typically will be perceived as challenging but attainable. Research has documented the benefits of proximal, specific, and moderately challenging goals on achievement outcomes.

RELEVANCE FOR TEACHERS

Students need to be provided with many opportunities to set short-term, specific, and moderately difficult goals in their classroom work:

- When selecting goals for a students with disabilities who are performing below grade level, set goals that are specific and achievable in a shorter time period (e.g., decoding list of 20 words by end of week or reading phonemes with automaticity in three months) rather than long term generic goals (e.g., reading at grade level in two years).
- Keeping a written record of goal progress that is regularly checked by both the student and the teacher is especially desirable.
- As students become proficient at setting moderately challenging proximal goals, they will learn to become intermediate risk takers (not aspiring too low or too high), which is one of the most important characteristics of achievement-oriented individuals.
- Teachers can also help students begin to think about more distal goals by developing contracts with them that specify a series of subgoals leading to the larger, more distal goal.
- Teachers can provide breaks in between tasks (e.g., movement break, quiet time) to ensure optimal efforts moving forward with set goals.

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Why are social context, interpersonal relationships, and emotional well-being important to student learning?

PRINCIPLE 13 Learning is situated within multiple social contexts.

EXPLANATION

Learners are a part of families, peer groups, and classrooms that are situated in larger social contexts of schools, neighborhoods, communities, and society. All these contexts are influenced by culture, including shared language, beliefs, values, behavioral norms, and understanding of special needs. Furthermore, these layers of context interact with each other (e.g., schools and families). Appreciating the potential influence of these contexts on learners can enhance the effectiveness of instruction and communication across contexts (e.g., between teachers and parents/guardians). In addition, learners with disabilities come from larger social systems (e.g., extended families, community) that impact their understanding of acquiring knowledge and skills in and out of the classroom. This was particularly important during the pandemic when caregivers and families took on a larger role in providing accommodations, trouble-shooting assistive technology, and supporting online learning. It is likely that online and remote learning will continue so understanding the home environment and supporting families is essential.

RELEVANCE FOR TEACHERS

Teachers who are aware of the potential influence of the classroom's social context on learners and the teaching-learning process can facilitate effective interpersonal relationships and communication with and between students and thereby affect learning:

- The more teachers know about the cultural backgrounds of students and how differences in values, beliefs,

language, and behavioral expectations can influence student behavior, including interpersonal dynamics, the better they will be able to facilitate effective teaching-learning interactions in their classrooms and outside of the classroom. For example, for students whose culture is more collectivist than individualistic, teachers can enhance learning experiences through more frequent use of cooperative learning activities.

- Teachers can relate the curriculum to students' cultural backgrounds—for example, through incorporating local history into social studies lessons, reading text from a diverse set of authors, or gearing science toward local health problems.
- Given potential variations in cultural experiences, it is critical that the teacher facilitate a “classroom culture” that ensures shared meanings, values, beliefs, and behavioral expectations and provides a safe and secure environment for all students, including students with disabilities.
- Establishing connections with families and local communities can help enhance understanding of student cultural experiences and facilitate shared understandings about learning. Family involvement facilitates student learning, so creating opportunities for family and community involvement in the work of the classroom is vital.
- Seeking opportunities to participate in the local community (e.g., attending local cultural events) can help connect the relevance of learning to students' everyday lives and enhance teachers' understanding of the cultural background and experiences of their students.
- It would be important to have open and on-going opportunities for conversations between teachers, learners, and parents/caregivers regarding the family's

understanding of specific needs related to the student's disability (e.g., assistive technology needs), observations, and their expectations. In this way, teachers can provide appropriate supports for the learner and their family in and out of the classroom.

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PRINCIPLE 14 Interpersonal relationships and communication are critical to both the teaching-learning process and the social-emotional development of students.

EXPLANATION

The teaching-learning process in PreK-12 classrooms is inherently interpersonal, encompassing both teacher-student and peer connections. These relationships are essential for facilitating healthy social-emotional development of all students. Given their social nature, classrooms provide an important opportunity to learn social skills such as communication and respect for others. Developing successful relationships with peers and adults is facilitated by communicating thoughts and feelings through verbal and nonverbal behavior.

When students with and without disabilities experience authentic and supportive friendships, they are happier, healthier, and safer. Just as students with disabilities may need to learn a range of social skills, such as social awareness and relationship skills, students without disabilities often need to learn how to be patient and inclusive. In special education, social skills help promote fully inclusive classrooms that enable positive and engaging relationships between students with disabilities, students without disabilities, and their teachers. As students with disabilities prepare for adulthood, the relationships that were built and the communication skills learned in school can help provide the foundation for a successful transition into the world of work, post-secondary education, adult living, and community participation.

Learning social skills should include both planned and unplanned instruction as well as opportunities for practice and feedback. Small goals, consistent with the student's individual abilities should be made with the goal of social interactions taking place in natural settings with peers. General social skills include cooperation/collaboration, perspective taking and seeking, respect for others' views, constructive feedback, interpersonal problem solving, and conflict resolution. Some students with disabilities may need instruction in specific social skill areas, such as nonverbal communication, social initiation, reciprocity and terminating interactions, social cognition, perspective taking and self-awareness, and social anxiety

or social withdrawal. There are a variety of social skills curricula available to teachers. Regardless of the social skills curriculum being used, it is critical that social skills instruction is explicit, systematic, and visual. Throughout the process of learning these skills, the focus should be on promoting positive relationships between students.

RELEVANCE FOR TEACHERS

Given the interpersonal nature of PreK–12 teaching and learning, teachers should attend to the relational aspects of the classroom. In special education, teachers can do this by implementing and monitoring activities that enable all students to develop social awareness and relationship skills. Social awareness refers to the ability to engage in perspective taking and empathy, appreciate diversity, and respect others for their unique qualities. Relationship skills refer to the ability to establish positive and reciprocal relationships using clear communication, active listening skills, conflict management skills, and trust.

- Teachers can use lessons on perspective taking from established social-emotional learning and disability awareness curricula.
- Teachers can work with students individually on discrete skills and then facilitate opportunities for students to practice those skills with others.
- Teachers can incorporate project-based learning opportunities that encourage cooperation and appreciation of each other's unique talent and skills, and the ability to give and receive constructive feedback from one another.
- Students with disabilities who use a form of augmentative alternative communication (e.g., communication device) should have access to it throughout their day. Other students may need to be provided with information about how best to communicate with this student.
- Teachers can provide clear behavioral expectations related to social interactions (e.g., respect for others, use of clear and direct communication, nonviolent conflict resolution) and opportunities for all students to experience successful social exchanges.
- Not only can teachers establish cooperative and supportive classroom norms, but it is also critical that teachers set clear injunctions against bullying in any form.
- Teachers should model the social skills that create a positive and inclusive social climate by engaging in active listening, demonstrating empathy and appreciation for diversity, and providing strategies for conflict resolution.
- By monitoring social skills development, teachers should work with counselors, psychologists, and special education staff to design and implement interventions focused on specific social skills that are needed to improve classroom climate and ensure the safety and well-being of all students.
- Teachers can work with special education teams to write social goals (e.g., social skills, social interactions with peers) into the Individualized Education Programs (IEPs) of students with disabilities. Formally adding social goals to the IEP allows the entire IEP team to focus on supporting friendships and inherently includes individualized supports, data collection, and progress monitoring and reporting.

Interpersonal relationships at school depend on clear communication in multiple forms and contexts. Effective student communication requires teaching and practice of component skills. Teachers may incorporate lessons in communication basics as part of the routine curriculum. For example, they might incorporate specific skills into a lesson (such as how to ask relevant questions) and provide opportunities to apply those skills, such as during cooperative learning. Students with disabilities may need explicit instruction, prompting, and visual supports or other accommodations in such lessons. In addition, teachers can:

- Prompt students to elaborate on their responses.
- Engage in give-and-take with other students during discussions.
- Seek clarification from others.
- Listen carefully to others.
- Read nonverbal cues.
- Provide opportunities for students to practice communication in both academic and social contexts.
- Provide feedback to enhance skill development.
- Model effective verbal and nonverbal communication by using active listening, matching facial expression with verbal messages, using questions effectively, providing elaboration in response to student questions, and seeking student perspectives.

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PRINCIPLE 15 Emotional well-being influences educational performance, learning, and development

EXPLANATION

Emotional well-being is integral to successful, everyday functioning in the classroom and influences academic performance and learning. It is also important to interpersonal relationships, social development, and overall health. Components of emotional well-being include beliefs and perceptions of oneself, confidence in one's abilities to meet classroom expectations, a sense of control over oneself and one's environment, self-regulation of emotions and behaviors, general feelings of well-being, and capacity for responding in healthy ways to everyday stresses. Being emotionally healthy depends on understanding, expressing, and regulating one's own emotions, as well as perceiving and understanding others' emotions. Finally, understanding others' emotions is influenced by how children perceive expectations from their educators and peers, and acceptance on the part of significant others in their classroom, family, peer group, community, and cultural environment (see Principles 13 and 14).

Students receiving special education services in their school have the same social and emotional needs as their peers, but often have additional needs, as well. Some students receive special education services under the IDEA category of *Emotional Disturbance* as these students have been identified as having social, emotional, and behavioral challenges that adversely impact their educational performance. However, students who are identified under other IDEA categories may also have social and emotional needs that outweigh those of their peers. For example, studies have found that students with intellectual disabilities and specific learning disabilities had higher rates of internalizing and externalizing disorders than their peers. Students receiving special education services also report greater dissatisfaction with their relationships with teachers, weaker bonds with school, perceive that school is more dangerous, and are more likely to be involved in bullying than students without disabilities. Therefore, for children receiving special education services, it is important to specifically and explicitly consider their social and emotional needs.

Another important consideration is whether social and emotional needs may look different among students receiving special education services than their peers. There

is concern that the social emotional needs of students with disabilities are more likely to go undetected than among students without disabilities, because social and emotional needs may be misattributed to, or overshadowed by, disabilities. Furthermore, students receiving IEP services are often “pulled out” of class to receive these services. Sometimes students are pulled from the non-core academic classes, such as health, PE, and advisory - the very classes during which Social and Emotional Learning (SEL) topics are most likely to be discussed and taught. As such, schools are encouraged to provide SEL opportunities to all students with disabilities. The same strategies shown to be effective for teaching academic content to students with disabilities (e.g., explicit instruction) can be used to teach social and emotional learning.

RELEVANCE FOR TEACHERS

The emotional well-being of students can influence the quality of their participation in the teaching–learning process, their interpersonal relationships, the effectiveness of their communication, and their responsiveness to classroom climate. Concurrently, the classroom climate can influence students’ sense of security and acceptance, perceptions of social support, sense of control, and overall emotional well-being. The teacher plays a key role in establishing a climate in which all students are accepted, valued, and respected; have opportunities for academic success and relevant support; and have opportunities for positive social relationships with adults and peers.

The delivery of social and emotional supports may be most effective when they are individualized for students receiving special education services. Teachers can help facilitate the well-being of students receiving special education services in the following ways:

- Specifically assess social and emotional needs of students, even when these are not the basis of the special education referral.
- Consider using inclusive curriculum design such as Universal Design for Learning (UDL) and explicit instruction to teach social and emotional skills, in the same way that students would be taught academic material.
- Use emotional vocabulary—for example, facilitating student labeling of emotions (e.g., happy, sad, fearful, angry).
- Model appropriate emotional expression and reactions.

- Teach emotion regulation strategies, such as “stop and think before acting” and deep breathing.
- Promote emotional understanding of others, such as empathy and compassion.
- Do not enable students to avoid circumstances that cause them stress or anxiety, but gently move them to approach their fears while using the coping strategies they have been taught.
- Monitor their expectations to ensure they are equally encouraging to all students, regardless of past performance or disability.
- Discuss social and emotional needs as part of IEP planning (including the section on bullying).
- Collaborate with school mental health providers (e.g., school psychologists, school counselors, school social workers) and other related service providers (e.g., school nurses, speech language pathologists) to coordinate efforts to meet the social and emotional needs of students with disabilities.
- Discuss with family members how they can support their child’s emotional well-being at home and in a school setting.

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How can the classroom best be managed?

PRINCIPLE 16 Expectations for classroom conduct and social interaction are learned and can be taught using proven principles of behavior and effective classroom instruction.

EXPLANATION

Students' ability to learn is as much affected by their interpersonal and intrapersonal behavior as it is by their academic skills. Student behavior that does not conform to classroom rules or teacher expectations cannot simply be regarded as a distraction to be eliminated before instruction can take place. Rather, behaviors conducive to learning and appropriate social interaction are best taught at the beginning of the academic year and reinforced throughout the year. These behaviors can be taught using proven behavioral principles. For students exhibiting more serious or consistent problem behaviors, understanding the context and function of the behavior is a key element in teaching appropriate replacement behaviors.

RELEVANCE FOR TEACHERS

- Improved social and classroom behavior, like academic skill, can be shaped and taught. In the most effective classrooms, classroom rules and expectations represent a social curriculum that is taught and retaught throughout the academic year. The first 2 weeks of school are considered a crucial time for teachers to establish their rules and expectations.
- Proactive disciplinary strategies that avoid behavior problems are always better than reactive strategies that try to reduce problem behaviors after they are already present. Thereafter, student behavior that does not conform to classroom rules becomes an opportunity to bring student attention back to classroom expectations.
- Classroom rules and expectations can be taught and retaught using the same principles as those used in academic instruction, including clear presentation of a goal, task, or behavior; opportunities for practice, with timely and specific feedback; reinforcement of desired behavior; and behavioral correction as needed. It is anticipated that students with disabilities may require individualized support to learn behavioral repertoires as well as more frequent practice to automatize them.
- A range of behavioral principles, including praise of appropriate behavior; differential reinforcement (desired behaviors or responses are reinforced and inappropriate behaviors or responses are ignored), correction, and planned consequences, can be used to consistently teach and remind students of their expectations. Effective teacher praise consists of two elements: (1) a description of noteworthy student academic performance or general behavior, and (2) a signal of teacher approval. Make sure that you praise effort and accomplishment. Make sure to match praise to culturally relevant reinforcement and student preference.
- If a teacher needs to correct a behavior, make sure to start with reteaching, that the correction does not involve punishment (application of a negative event), or removal of a reinforcer (negative reinforcer). Rewarding
- A common assumption is that instruction is only intended for those who are “ready to learn” and that the learning environment will be improved if those who disrupt or distract from it are removed. Simply removing students from the class is not an effective instructional technique. For those identified with a disability, removal from class may violate their access to a Free and Appropriate Public Education (FAPE) in the Least Restrictive Environment (LRE) or be considered a change of placement. It is always important to be familiar with a student’s individualized education program (IEP) or 504 plan.

a behavior that is corrected increases a behavior that you want to occur again.

- On the schoolwide level, these same principles can be used to clarify expectations and reward positive behavior through programs such as Positive Behavior Interventions and Supports (PBIS). Ideally, expectations would be similar if not identical across the classroom and school building.
- The problem-solving process known as functional behavioral assessment (FBA) has enabled teachers and school psychologists to identify the antecedent events and functional relationships associated with inappropriate behavior. The information drawn from an FBA enables school personnel to identify appropriate replacement behaviors—that is, more adaptive behaviors that allow students to reach the same behavioral goal in a more acceptable way. One method for promoting consistent communication that is focused on student positive behavior is a daily report card. To promote consistent behavioral *self-regulation* across settings by older elementary and secondary school students, a “matching” process can be used. This is where teachers, parents, and students can independently rate student behavior related to specific goals with students gradually assume greater control of rating and reinforcement decisions.
- Teachers can discuss with family members expectations for behavior and its impact on teaching, learning, and success in the school setting.

MAKE IT YOUR HABIT TO TIE PRAISE TO CLASSROOM ROUTINES

Like any other behavior, providing targeted and intentional praise can become a habit - the more you practice, the more comfortable and automatic the action becomes. To intentionally design praise as an effective habit:

- Consider all of the typical classroom activities where praise can be delivered (e.g., large-group instruction; student cooperative-learning activities; independent seatwork).
- Set your own goals. Decide on a minimum number of group and/or individual praise statements to deliver as a part of the routine instructional activity (e.g., 5 praise-statements during large-group instruction; 5 praise-statements to individuals during independent seatwork).
- Track your own progress. Monitor the number of praise-statements actually delivered and compare them to your goals.
- The more you practice, the stronger the habit you are forming. The start of activities will serve as a cue to remind you to deliver praise. In this way, praise becomes a habit easily embedded in *your* classroom routine.
- On a daily basis, be aware if there are any biases toward students whom you give more praise to and why.

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PRINCIPLE 17 Effective classroom management is based on (a) setting and communicating high expectations, (b) consistently nurturing positive relationships, and (c) providing a high level of student support.

EXPLANATION

At both the classroom and the school level, the development of an effective learning climate is based on structure and support. In terms of structure, students need to have a clear understanding of the behavioral rules and expectations of the classroom, and these expectations must be communicated directly and frequently and consistently enforced. Yet we also know that support is essential. To be both effective and culturally responsive, teachers can develop and maintain strong, positive relationships with their students by consistently communicating that they are firmly committed to supporting all of their students in meeting those high academic and behavioral expectations.

RELEVANCE FOR TEACHERS

Students profit from a predictable structure and high expectations for both academic achievement and classroom behavior.

For example:

- A safe and well-arranged physical environment, a predictable schedule, and rules that are clearly explained and consistently enforced all contribute to a safe and orderly learning climate that reduces distraction and keeps the focus on academic instruction.
- High expectations, especially when communicated in a punitive manner, are not sufficient to establish and maintain a positive and productive learning climate. The most effective teachers, schools, and programs also emphasize the development of supportive and nurturing relationships with students.
- Maintaining a high ratio of positive statements and rewards to negative consequences, as well as expressing respect for all students and their heritage, builds trust in the classroom.

At the school level:

- Programs such as Restorative Practices enable students to gain an understanding of how to restore relationships damaged by disruption and violence through strategies such as collaborative decision making.
- Social-emotional learning strategies explicitly teach students interpersonal and intrapersonal skills (e.g., managing emotions, establishing positive relationships, and making responsible decisions) needed to succeed in school and society.
- Balancing structure and support are central to culturally responsive classroom management and are associated with lower levels of suspension and bullying when applied at the school level.
- Strategies from family members and what works from home that can be used in the school setting.

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How can teachers assess student progress?

PRINCIPLE 18 Formative and summative assessment are both important and useful but require different approaches and interpretations.

EXPLANATION

Formative assessment is used to guide and shape classroom instruction directly. *Summative assessments* are designed to produce an overall judgment of student learning progress or the effectiveness of educational programs. Formative assessment practices take place before or during instruction, can be “on the fly,” and have the explicit purpose of improving current learning. Summative assessments measure learning at a particular point, usually at the end of a unit of study, semester, or academic year, and by design provide limited opportunities to influence current learning activities. In the United States, most students with and without disabilities take their state’s summative assessments based on grade level instructional goals, but special education students are also likely to take other summative assessments. For example, norm referenced achievement tests or diagnostic reading assessments may be used to inform if a student qualifies for special education services, monitor student progress, and/or inform development of an Individualized Education Program.

The approach used to collect information from students is likely to differ between the two types of assessment, given their different purposes. Formative assessments, in the service of achieving learning goals, are more likely to incorporate learning progressions and include discussion, collaboration, self- and peer assessment, and descriptive feedback. Summative assessments, given their purpose of evaluating progress against a benchmark, are more likely to be high-stakes, standardized large-scale assessments

that evaluate individual work to yield an overall score or performance-level designation. In some cases, summative assessments may be used, along with other sources of data, to determine if a student is making adequate progress or needs additional special education services.

Both formative and summative assessments can be developed by teachers or those outside of the classroom—for example, by a testing company on behalf of a state agency. In general, however, formative assessments are more likely to be developed by teachers, and large-scale, high-stakes assessments are more likely to be developed by an external organization. Overall, the goal of formative, summative, and diagnostic assessments are fundamentally the same—to produce valid, fair, useful, and reliable sources of information.

RELEVANCE FOR TEACHERS

Employing formative assessments and formative assessment practices can result in important increases in student learning when teachers:

- Clearly communicate to students the purposes of each assessment and how it aligns to instructional goals.
- Set achievable instructional goals and align assessments to those goals. For most students with disabilities these instructional goals will be based on grade level achievement standards. For students with significant cognitive disabilities, review your state’s *alternate achievement standards* to consider how to adapt grade level content.
- Use lessons and other classroom experiences to collect evidence on student learning.
- Use this evidence to help understand what students know and promptly redirect students as needed, and update individualized instructional and/or IEP goals.

Teachers can improve the effectiveness of formative assessments when they:

- Focus systematically on setting goals with their students.
- Employ principles of Universal Design to ensure all students can access any technology used for formative assessment (e.g., classroom clickers, quizzes, etc.). For example, students with disabilities that impact reading may require embedded accommodations that allow for text to be read aloud. Likewise students with visual disabilities will require tactile drawings or alternate text descriptions of graphics or visual images.
- Determine whether students have met these goals or identify what prerequisite skills are still developing.
- Consider how to improve their instruction in the future.
- Keep the length of time between the formative assessment and subsequent interventions relatively short; this is when effects on student learning will be strongest.
- Teachers can make better use of both formative and summative assessments when they understand basic concepts related to educational measurement. Teachers can also use assessment data to evaluate their own instruction to consider whether they adequately covered the material they intended to cover and whether they were effective in meeting their instructional goals. Teachers will also want to ensure that their assessments align with overall learning goals to elicit questions in different ways to assess students' level of knowledge.

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PRINCIPLE 19 Students' skills, knowledge, and abilities are best measured with assessment processes grounded in psychological science with well-defined standards for quality and fairness.

EXPLANATION

PreK–12 teachers and leaders are working in an era when assessments are a constant topic of discussion and debate. It is important to remember, however, that there are clear standards for judging the quality of assessments of any type. This is true of both formative and summative assessment (see the *Standards for Educational and Psychological Testing*; AERA, APA, & NCME, 2014). These standards for assessment reference additional accessibility standards that are particularly important for special education students, and mention both Universal Design and Web Content

Accessibility Guidelines (WCAG). These additional standards and guidelines are requirements of many federal and international laws such as the Individuals with Disabilities Education Act and Section 508 in the United States or Mandate 376 in the European Union. **Assessments that are accessible, reliable, and valid help test score users make appropriate inferences about students' knowledge, skills, and abilities.**

The validity of an assessment can be thought of in relation to four essential questions:

- How much of what you want to measure is actually being measured?
- How much of what you did not intend to measure is actually being measured?
- What are the intended and unintended consequences of the assessment?
- What evidence do you have to support your answers to the first three questions?

The validity of an assessment tool is not simply a number. It is a judgment, over time and across a variety of situations, about the inferences that can be drawn from test data, including the intended or unintended consequences of using the test. For example, test users need to be able to infer from a test score that it accurately reflects student learning and not other factors. For this to be true, the test must be validated for the purpose and population for which it is being used. Further, individual test takers must be motivated to show what they can actually do. Otherwise, school personnel cannot tell if student learning is being measured.

Fairness is a component of validity. Valid assessment requires saying clearly what an assessment is and is not supposed to measure and requires evidence of this for all test takers. Tests showing real, relevant differences are fair; tests showing differences that are unrelated to the purpose of the test are not. Fairness should also consider how test scores will be used and if students have had the opportunity to learn. If test scores will be used to limit students' educational opportunities (e.g., placement in honors classes), all students should have an equitable opportunity to learn the content on the assessment.

Reliability of an assessment is also a key factor. A reliable assessment is one whose results are consistent indicators of student knowledge, skills, and abilities. Scores should not

be affected by chance factors associated with, for example, student motivation or interest as it relates to a given set of test questions, variations in testing conditions, or other things that are not part of what test givers intend to measure. In general, longer tests are more reliable than shorter tests.

RELEVANCE FOR TEACHERS

Whenever teachers give an assessment, it is best to consider its strengths and limitations with respect to what they hope it will tell them about their students' learning. Teachers can apply strategies to improve the reliability of their assessments and be cognizant of why some assessments will be more reliable than others. Teachers can also select online assessment tools that ensure both current (and future) students with disabilities will be able to access the material using needed supports and accommodations (e.g., extended testing time, text to speech, keyboard navigation, or videos with closed captioning). Ways in which teachers can improve the quality of the assessments they use include:

- Apply the principles of Universally Designed Assessment Systems to classroom assessment to ensure all students can access the content and show what they know and can do.
- When selecting digital tools for assessments, request a Voluntary Product Accessibility Template (VPAT), search for accessibility reviews or look for 508 compliance documents on the product website.
- Carefully align assessments with what is taught.
- Use a sufficient number, variety, and types of questions on the same topic.
- Be mindful that tests that are valid for one use or setting may not be valid for another. For example, tests designed for school accountability may not be valid for use in determining readiness for the next grade level.
- Base high-stakes decisions on multiple measures instead of a single test.
- Identify accessibility needs for each student individually instead of by disability category. For example, one student who is visually impaired may need a braille test booklet while another student may require text-to-speech.
- Determine if a student can demonstrate their knowledge, skills, and abilities with the approved accommodations and universal supports.

- Monitor outcomes of assessment procedures and outcomes to determine whether there are consistent discrepancies across students from different subgroups and intersectional subgroups (e.g., English learners). For example, are some subgroups of students routinely overrepresented in special education referrals, emotional behavioral classifications, gifted and talented opportunities?
- Review your state's *alternate achievement standards* to consider how to adapt grade level content for students with significant cognitive disabilities.

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PRINCIPLE 20 Making sense of assessment data depends on clear, appropriate, and fair interpretation.

EXPLANATION

The meaning of assessment outcomes depends on clear, appropriate, and fair interpretation. Scores from any assessment should generally be used only for the specific purposes for which they were designed. For example, tests used to diagnose student's with a specific disability may be valid, fair, and useful for that purpose, but these tests would likely be misleading for determining the strengths and weaknesses of each individual student's mastery of material in a particular subject-matter area.

Interpretation of test data for special education students may require additional information on the manner in which the assessment was delivered. For example, testing accommodations or tools may be required to allow students to demonstrate their knowledge, skills, and abilities. If these accommodations improve performance but are used inconsistently, it can alter interpretations of growth scores (that compare a student's performance from year to year).

RELEVANCE FOR TEACHERS

Effective teaching depends heavily on teachers being informed consumers of educational research, effective interpreters of data for classroom use, and good communicators with students and their families about assessment data and decisions that affect students. Teachers can weigh curriculum and assessment choices to evaluate whether those resources are supported by research evidence and are suitable for use with diverse learners.

- To effectively interpret assessment data, teachers should address the following about any assessment they use:
 - What was the assessment intended to measure?
 - Pay particular attention to skills that may be

impacted by a disability (e.g., see, hear, speak, or decode text or symbols).

- What comparisons are the assessment data based on? Are students being compared to one another? Or, instead, are students' responses being directly compared to samples of acceptable and unacceptable responses that the teacher or others have provided?
- Consider if testing accommodations were provided and used consistently when comparing data across two assessment scores.
- When students are performing significantly above or below grade level standards, to evaluate growth and plan instruction, consider using assessments that adapt difficulty based on student responses or assessments that provide feedback on performance relative to a learning progression.
- Data gathered from any assessment are best interpreted in light of their suitability for addressing specific questions about students or educational programs, their appropriateness for individuals from a variety of different backgrounds and educational circumstances, and the intended and unintended consequences that result from using the assessment. Because both higher- and lower-stakes tests can have significant impact on students, it is important to make careful interpretations of the results of either type of test.
- Awareness of the strengths and limitations of any assessment is critical. Such awareness also enables teachers to communicate caveats, such as possible imperfect reliability of scores (see more on this in Principle 19), and the importance of using multiple sources of evidence for high-stakes decisions.

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** signifies a new reference added since the original Top 20 was published.*