



PURPOSE

Teachers are exposed to a constant barrage of methodologies that promise to improve both instructional strategies and student learning through institute days, team meetings, seminars and the media. While some of this information is helpful, some of the suggestions have little or no empirical data to support their effectiveness. The Coalition for Psychology in Schools and Education (CPSE), a group of psychologists and psychology teachers within APA, recently announced the publication of the “Top 20 Principles from Psychology for pre-K to 12 Teaching and Learning.” The Top 20 document was created by psychologists representing a wide range of divisions, including those focused on education, school, developmental, social, cognitive, psychometrics, media, counseling and clinical psychology. Each of the contributors has some expertise in the application of psychological science to early childhood, elementary, secondary, gifted or special education; social/emotional learning; or school climate.

The principles are organized into five areas of psychological functioning: cognition and learning; motivation; social and emotional dimensions; context and learning; and assessment. Each of the individual principles listed in the document includes an explanation of the concept, its relevance for instruction, specific tips for teachers and a comprehensive list of related references.

COGNITION AND LEARNING: HOW DO STUDENTS THINK AND LEARN?

A great deal of research from cognitive and educational psychology has discovered how thinking and learning can be improved in the classroom. The first eight principles highlight some of the most important findings on teacher practices that impact student growth.

Growth Mindset

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

Research shows that learners who hold the growth mindset that intelligence is malleable, and success is related to effort level are more likely to remain focused on goals and persist despite setbacks. A great way to start off the year in a psychology class is with a discussion of growth versus fixed mindsets because it helps students understand how their beliefs about intelligence can influence their own academic success. For more information about fixed and growth mindsets and how they impact student performance, see the TED talk by psychologist Carol Dweck. A TED talk by Angela Lee Duckworth discusses how student learning can be examined in the context of motivation and illustrates how the personality trait of grit, which is correlated with success, can be developed through teaching of a growth mindset. In addition to the numerous specific ideas in the Top 20 document for how instructors can encourage students to develop a growth mindset, there is also an APA online module on praise that offers excellent examples of how instructors can best frame communication with students to foster a growth mindset.

Prior Knowledge

What students already know affects their learning.

Research shows that prior knowledge influences both conceptual growth and conceptual change in students. With conceptual growth, students add to their existing knowledge, and with conceptual change, students correct misconceptions or errors in existing knowledge. Facilitating conceptual growth or change requires first obtaining a baseline level of student knowledge prior to the start of each unit through formative assessment. One way to assess prior knowledge involves starting the unit with a short list of five to ten true/false statements and having a class discussion about the results. The results of this



discussion can guide the selection of assignments and activities that will be appropriate for facilitating either conceptual growth or conceptual change. Prior knowledge can be used to help students incorporate background knowledge and draw connections between units during the course.

Limits of Stage Theories

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

Research indicates that cognitive development and learning are not limited by general stages of development. It is important for instructors teaching Piaget's cognitive stage theory to also reference the limitations of this approach. Psychology curricula should highlight the significance of Lev Vygotsky's theory of zone of proximal development and the critical role that interactions with those who are more capable can have on learning and growth. Instructors can use this research to facilitate learning by designing instruction that utilizes scaffolding, differentiation and mixed ability grouping. It is also critical that the most advanced students have the opportunity to work with others who will challenge them, including other students or the instructor.

Facilitating Context

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

Student growth and deeper learning are developed when instructors help students transfer learning from one context to another. Students will also be better able to generalize learning to new contexts if instructors invest time in focusing on deeper learning. One method of developing this skill is to have students use their understanding of a particular unit to generate potential solutions for real-world problems. APA Teachers of Psychology in Secondary Schools (TOPSS) offers an excellent example of this type of assignment with the problem-focused unit on childhood obesity (PDF, 260KB).

Practice

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

This principle details empirically based strategies that will help students more effectively encode learned materials into long-term memory. In addition to those in the memory unit, examples from this principle can help inform instruction throughout the course. By issuing formative assessment frequently through practice problems, activities and sample tests, instructors can help students increase their knowledge, skills and confidence. Additionally, instructors conducting practice activities at spaced intervals (distributed practice) will help students achieve greater increases in long-term retrieval ability. Practice tests should include open-ended questions that require both the retrieval of existing knowledge and the challenge of applying that information to new situations or contexts, thus also incorporating principle four. See also the APA teaching module on practice for knowledge acquisition.

Feedback

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

This principle highlights the importance of instructor responses and indicates the best manner in which to deliver feedback to students in order to maintain or increase motivation to learn. Providing students with clear, explanatory and timely feedback is important for learning. The CPSE publication titled "Using



Classroom Data to Give Systematic Feedback to Students to Improve Learning” provides additional information about feedback methods including five key strategies.

Self-Regulation

Students’ self-regulation assists in learning and self-regulatory skills can be taught.

Self-regulation skills, including attention, organization, self-control, planning and memory strategies, improve learning and engagement and can be taught through direct instruction, modeling and classroom organization. Teachers can model organizational methods and assist students by highlighting learning targets at the start and conclusion of lessons, using classroom calendars, highlighting difficult concepts that will require more practice, breaking large projects into manageable components, using well designed rubrics and allowing sufficient processing time through questioning, summarizing and practice. Psychology students can apply this research to their own study habits such as learning to practice self-control by limiting the distractions presented by cell phones and social media. Students can also be encouraged to design experiments related to the limits of attention and discuss the practical implications of their results.

Creativity

Student creativity can be fostered.

Creativity is considered a critical skill for the technology driven world of the 21st century and because it is not a stable trait, it can be taught, nurtured and increased. This principle describes specific methods of structuring assignments to increase creativity and ideas for how to model creative problem solving. Creativity in the psychology classroom can include opportunities for student-designed research projects, video projects, demonstrations and model building. The TOPSS unit lesson plans include a variety of ideas for creatively engaging students.

MOTIVATION: WHAT MOTIVATES STUDENTS?

Students who are motivated and interested in learning are more successful. CPSE has outlined the most important ways to help increase student motivation and engagement.

Intrinsic Motivation

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

This principle is directed at how instructors can increase intrinsic motivation through classroom practices and activities that support the fundamental need of students to feel autonomous. It is important to note that not everything of importance is intrinsically motivating to all students and that there is a place for extrinsic motivation in education. During the unit on motivation, when intrinsic and extrinsic motivations are typically discussed, students can examine their personal motivations and how they influence their success. Lastly, students can examine the research related to the over justification effect, also discussed in this principle.

For more information about motivation and the over-justification effect and how they impact student performance, see the TED talk by psychologist Dan Pink.

Mastery Goals



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

Students who form mastery goals are focused on attaining new skills or increasing existing ability, but students who develop performance goals typically are focused simply on showing adequate ability. When students set performance goals, they have a tendency to avoid tasks that might expose weaknesses and end up missing opportunities that would foster the development of new skills. Those with mastery goals are more likely to be motivated to learn new skills and achieve higher levels of competence. Principle 10 provides specific methods for organizing instruction that can be used to help students choose mastery over performance goals although under certain circumstances such as competitions, performance goals may be more appropriate.

Teacher Expectations

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

The beliefs that teachers have about their students affect students' opportunities to learn, their motivation and their learning outcomes. Psychological research has uncovered ways for teachers to communicate high expectations for all students and avoid creating negative self-fulfilling prophecies. When discussing self-fulfilling prophecies and the Rosenthal and Jacobson study during the social psychology unit, Principle 11 can be used by teachers to show students how they can prevent negative self-fulfilling prophecies.

Goal Setting

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.

This principle explains how students can use short-term (proximal), specific and moderately challenging goals to increase self-efficacy and build toward larger goals. Students should maintain a record of progress toward their goals which is monitored by both the student and the instructor. After students experience success with moderately challenging proximal goals, they will be more likely to become intermediate risk takers, which is one of the most significant attributes present in achievement-oriented individuals. As a result, they will be capable of achieving larger distal goals. Tips based on this principle can easily be used to create engaging class assignments for the motivation unit in the introduction to psychology curriculum.

SOCIAL AND EMOTIONAL DIMENSIONS: WHY ARE SOCIAL CONTEXT, INTERPERSONAL RELATIONSHIPS AND EMOTIONAL WELL-BEING IMPORTANT TO STUDENT LEARNING?

These principles reflect the importance of relationships, culture, community and well-being on learning. They focus on how instructors can help students by fostering healthy relationships with them and an interest in their lives outside the classroom.

Social Contexts

Learning is situated within multiple social contexts.

Principle 13 emphasizes how the various communities students belong to (e.g. families, peer groups, schools, and neighborhoods) and their culture (e.g. shared language, beliefs, values and behavioral norms) influence learning. This principle is related specifically to many concepts from social psychology (e.g.,



norms, attribution theory, individualistic versus collectivist cultures) and provides suggestions for incorporating culture into every unit to increase student engagement and build stronger relationships. Introductory psychology classes can incorporate opportunities for students to engage with the larger community through service-learning projects, guest speakers and psychology clubs. TOPSS has developed a teaching module that includes background information and activities for expanding student understanding regarding culture and social contexts titled “An Introduction to Cross-Cultural Psychology.”

Interpersonal Relationships

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

This principle provides detailed and specific guidelines for improving both teacher-student and student-peer relationships in the classroom. See also the APA teaching module on improving students’ relationships with teachers for essential supports for learning based on this principle.

Well-Being

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

Various components of emotional well-being can be included across many psychology units, such as self-concept and self-esteem (social psychology), self-efficacy and locus of control (motivation and personality) and happiness and coping skills (emotion and stress). TOPSS has developed a teaching module that includes background information and activities related to positive psychology (PDF, 164KB) and the science of improving emotional well-being.

CONTEXT AND LEARNING: HOW CAN THE CLASSROOM BEST BE MANAGED?

The two principles related to classroom management emphasize how to develop a classroom climate that enhances learning.

Classroom Conduct

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

Numerous research-based ideas are presented for both correcting inappropriate student behaviors and for establishing appropriate replacement behaviors at both the classroom and school-wide levels. See also the APA teaching module on classroom management and the APA video modules on classroom management.

Expectations and Support

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.

This principle highlights practical techniques to create a culture of high academic achievement and positive classroom behavior at both the classroom and school levels. The Top 20 document references information about restorative practices and social and emotional learning that includes a variety of specific and practical strategies for building teacher-student relationships.



ASSESSMENT: HOW IS STUDENT PROGRESS ASSESSED?

The three principles devoted to the process of student evaluation discuss methods for creating and implementing valid and fair assessments that contribute to student learning.

Formative and Summative Assessment

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

Formative assessments are typically used as a part of everyday practice and are given either prior to or during instruction. Such tools are designed to collect evidence regarding the progress of student learning in order to provide effective guidance. Summative assessments, on the other hand, result in an overall evaluation of student learning or program effectiveness and are typically utilized at the end of a unit or course thus having more limited impact on current instruction. Frequent use of formative assessment accompanied by immediate and specific instruction helps students achieve learning goals and assume a greater responsibility of their own learning process. The analysis of data collected through formative assessment allows the instructor to differentiate instruction and provide appropriate individualized support. See also the APA teaching module on formative assessment.

Assessment Development

Student skill, knowledge, and ability are best measured with assessment processes grounded in psychological science with well-defined standards for quality and fairness.

Formative and summative assessments need to be evaluated for both reliability and validity. The Top 20 document provides instructors with four essential questions that can be used to evaluate the overall validity of a particular assessment for measuring student learning and tips for measuring reliability. Instructors can improve the reliability and validity of formative and summative assessments by aligning them to learning targets, utilizing item analysis, discussing the results with other educators, and monitoring outcomes for discrepancies across groups or subgroups of students. During the unit on intelligence and individual differences, it can be helpful to demonstrate to students how the exams they are taking can be evaluated for content validity by illustrating how the assessments are aligned with learning targets or the National Standards for High School Psychology Curricula.

Assessment Evaluation

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

Effective teaching requires that instructors be able to accurately interpret test results and clearly communicate the results to students and parents. Students can use what they learn about testing and statistics to evaluate the various assessments given in class for reliability and validity. Discussions of descriptive statistics are more meaningful when students examine their own assessments.

CONCLUSION

Certainly there will be debate about the Top 20 principles, and many research-based educational practices are not included in the document. Although this is not an exhaustive list of educational psychological research, it does provide an important starting point for improving teaching and learning outcomes. The Top 20 principles were vetted over many years based on major documents related to the science of teaching and learning, and the purpose of the project was not to provide a comprehensive list, but a prioritized one. These principles are helpful for the



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Student Learning Principles

instructor but can also be incorporated into the psychology curriculum as examples of how applied psychology can be used to solve real-world problems. At the same time, these principles will help students develop skills to learn more effectively in all of their classes.