Strategies for Managing a Heterogeneous Classroom

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Reassessing Old Paradigms

• “Coping” with a range of student learners versus structuring our teaching and learning around heterogeneity.
• “Classroom management” about control, discipline, compliance versus learning communities where students have a stake in their own learning.
• One way communication to students (e.g., lectures) versus interactive roles for teachers (e.g., facilitating, demonstrating, and modeling).
• “Sage on the stage” versus “guide on the side” (for activities that involve questioning, problem-solving, investigating).
Appropriate Learning Environments

• Organized classrooms that run smoothly.
• Created by teachers who see the classroom through students’ eyes.
• Where teachers keep a close eye on student behavior and who deal with off-tasks swiftly.
• Where information is communicated clearly, and tasks are broken down step-by-step.
• Feature teachers who teach appropriate academic and social skills expectations.
• Where students have choices about tasks and responsibility for their own learning.
• Take into account students’ learning styles, attention spans and intelligences.
• Students need appropriate challenges, secure environments, opportunities to explore ideas and gain mastery.
• Students need to learn to ask questions, to think critically and to interact verbally.
• Students need to be able to construct meaning by interacting with peers, problems, and issues.
• Learning is more effective if concepts are learned in context and related to existing knowledge and to emotional affect. Students cannot actually learn—apply their knowledge—without emotional engagement. Thinking clearly is an emotional process.
• Not all students need to be doing the same thing at the same time. Group work is an option.

• Students are not at the same level of readiness, and they don't learn in the same way. Assignments can be distributed so that groups of students can be working at different rates.

• Students need to be actively involved in making decisions and modifications to their learning efforts. They benefit from reflecting on their learning styles and processes.

• Peer teaching may be as valuable for the child who is “teaching” as it is for the “learner.”
Gray matter wanes as the brain matures. Here 15 years of brain development are compressed into five images, showing a shift from red (least mature) to blue.
Use it or lose it...

Nerve Proliferation...

- By age 11 for girls and 12 for boys, the neurons in the front of the brain have formed thousands of new connections. Over the next few years most of these links will be pruned.

...and Pruning

- Those that are used and reinforced — the pathways involved in language, for example — will be strengthened, while the ones that aren’t used will die out.
Inside the Adolescent Brain

The brain undergoes two major developmental spurts, one in the womb and the second from childhood through the teen years, when the organ matures by fits and starts in a sequence that moves from the back of the brain to the front.

"If a teen is doing music, sports or academics, those are the connections that will be hard wired. If they're lying on the couch or playing video games or MTV, those are the cells and connections that are going to survive."

SOURCES: Dr. Jay Giedd, Chief of Brain Imaging, Child Psychiatric Branch—NIMH; Paul Thompson; Andrew Lee; Kiralee Hayashi; Arthur Toga—UCLA Lab of Neuro Imaging and Nitin Gogtay; Judy Rapoport—NIMH Child Psychiatry Branch.

TIME Diagram by Joe Lertola. TIME.com graphic by Garrett Rosso. The Image Bank—Getty Images

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Brief Look at the Adolescent Brain

- Corpus Callosum: Thought to be involved in problem solving and creativity. During adolescence, fibers thicken and process information with increasing efficiency.
- Basal Ganglia: Helps the prefrontal cortex organize information.
- Amygdala: Emotional center of the brain—primal emotions: fear, rage, fight/flight/freeze, strong likes/dislikes. Teens rely heavily on the amygdala, responding more with their “gut.”
- Prefrontal Cortex: Responsible for executive functioning: organization, impulse control, rational thought, planning, judgment, anticipation, abstract thinking, resisting temptation, goal setting, strategizing.
Perils of One-Size-Fits-All

• “Three principles from brain research: emotional safety, appropriate challenges, and self constructed meaning suggest that a one-size-fits-all approach to classroom instruction teaching is ineffective for most students and harmful to some." --Carol Ann Tomlinson
Learning environments must feel emotionally safe for learning to take place.

- If a student feels unsafe, his brain produces noradrenalin, which triggers the fight/flight/freeze impulse: self-preservation over learning.
- Stress also impedes the hippocampus, the brain’s learning and memory center.
- Students whose learning style or readiness is not addressed in a class will not feel safe.
To learn, students must experience appropriate levels of challenge.

• If the curriculum transcends a student’s readiness, stress neurotransmitters are produced; they impede learning.

• If the curriculum is redundant, the brain does not engage or respond, so it does not release the levels of dopamine, noradrenalin, serotonin and other neurochemicals needed for optimal learning.
Each brain must make its own meaning of ideas and skills.

- What enables academically diverse students to make sense of essential understandings and skills?
- Teaching based on concepts and the principles that govern them: learners can better construct frameworks of meaning, see the relationship between the parts and the whole, relate the subject to his or her own life, use the ideas more readily, and retrieve and remember ideas/information better.
- Struggling learners can focus on what is most important and powerful in the curriculum, while advanced learners can extend their understanding in a meaningful way.
- Brain learns best when it "does," (not when it "absorbs"). Challenge students to think at a high level to solve challenging problems.
Components of Differentiated Classrooms

- Teachers find out about students' current readiness, interests, and learning profiles.
- Teachers use this information to provide varied learning options and build learning experiences around the important concepts of the content.
- Students use essential skills to address open-ended problems designed to help them make sense of key concepts and principles.
- Teachers often present several learning options at different degrees of difficulty to ensure appropriate challenge for students at varied readiness levels.
Components of Differentiated Classrooms

• Teachers often give students choices about topics of study, ways of learning, modes of expression, and working conditions.
• Teachers present information in varied ways: orally, visually, through demonstration, part-to-whole, and whole-to-part.
• Instructional approaches invite attention to individual needs, for example, learning contracts, graduated rubrics, complex instruction (involving open-ended tasks around a big concept), readiness, and problem-based learning.
• Students collaborate with teachers and peers.
Components of Differentiated Classrooms

- Teachers meet all students at their starting points and guide each one along a continuum of growth as far and as quickly as possible.
- Teachers may assign students to groups in various ways (randomly, similar readiness, mixed readiness, similar interests, mixed interests, similar learning profile, or mixed learning profile).
- Teachers design homework to extend the individual's understanding and skill level.
- Varied assessment options: portfolios, authentic problems to solve, oral presentations, and tests.
- Grade reports are based, at least in large measure, on individual growth.
Teaching Heterogeneous Students Lends Itself to Teaching 21st Century Skills

Tony Wagner: Co-director of Harvard’s Change Leadership Group, promoting higher levels of intellectual and social skills for work, citizenship, and life-long learning:

1. Critical Thinking and Problem Solving
2. Collaboration and Leadership
3. Agility and Adaptability
4. Initiative and Entrepreneurialism
5. Effective Oral and Written Communication
6. Accessing and Analyzing Information
7. Curiosity and Imagination

Examples of Performance-Based Tasks
(from the College Work Readiness Assessment)

• In “Crime Reduction,” the student assumes the role of consultant to a mayor running for reelection against a city councilman whose ideas for fighting crime are drastically different than those of the mayor.

• In “Sweetgrass,” the student is a journalist writing an article about a new high-fructose sugar made from sweetgrass. The documents include a weekly news magazine article about obesity, a journal article on sweetness and obesity, a food industry review on sugar metabolism, and medical journal article abstracts.

Source: http://www.vbschools.com/schools/testing/cwraStudents.asp
More Examples...

• In “Museum,” the student is a museum curator assigned with designating various works of art (paintings, photos, poems) to different walls that represent the positive, negative, and ambiguous effects of technology.

• In “Airplane,” the student is an executive assistant at a company that makes precision electronic instruments. The company’s sales department is about to buy a small private plane (SwiftAir 235) when suddenly an accident involving another SwiftAir 235 occurs. The student must make a recommendation whether to buy the plane based on information about the accident and the performance characteristics of the SwiftAir 235, as well as other information including an FAA report on single-engine airplanes.

Source: http://www.vbschools.com/schools/testing/cwraStudents.asp
Additional References

Council for Aid to Education. [http://www.cae.org/default.asp](http://www.cae.org/default.asp)

Enhance Learning With Technology. [http://members.shaw.ca/priscillatheroux/differentiating.html](http://members.shaw.ca/priscillatheroux/differentiating.html)


