

# Annotated Bibliography of Theory and Research Related to Differentiation of Instruction

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## Theory that Informs Differentiation

- Amabile, T. (1983). *The social psychology of creativity*. New York: Springer-Verlag.  
By helping students discover and pursue their interests and passions, we can maximize their engagement with learning, their productivity, and their individual talents.
- Banks, J. (1994). *Multiethnic education: Theory and practice*. Boston: Allyn and Bacon.  
Particular instructional materials, curriculum, staff attitudes and beliefs, policies, teaching styles, assessment procedures, and other facets of schools may be more advantageous to members of some gender or cultural groups and disadvantageous to others. As a result teachers may misalign learning opportunities.
- Berliner, D. (1984). *Research and teacher effectiveness. Making our schools more effective: Proceedings of three state conferences*. San Francisco: Far West Laboratory.  
Student achievement is not likely to improve when teachers ask students to practice what they already know. Student achievement is also likely to be negatively impacted when teachers ask students to complete tasks that cause the students ongoing frustration.
- Berliner, D. (1988). *The development of expertise in pedagogy*. New Orleans: American Association of Colleges for Teacher Education.  
Student achievement is not likely to improve when teachers ask students to practice what they already know. Student achievement is likely to be negatively impacted when teachers ask students to complete tasks that cause the students ongoing frustration.
- Bransford, J. D., A. L. Brown, et al., Eds. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.  
When students encounter tasks at moderate levels of difficulty they are more likely to sustain their efforts to learn even in the face of difficulty than when tasks are too difficult or under-challenging.
- Bruner, J. (1961). "The act of discovery." *Harvard Educational Review*, 31, 21-32.  
When interest is tapped, learning is more likely to be rewarding and students are more likely to become autonomous learners.
- Byrnes, J. (1996). *Cognitive development and learning in instructional contexts*. Boston: Allyn and Bacon.  
Instruction must always be in advance of a child's current level of mastery for growth to occur.
- Collins, M. and T. Amabile (1999). *Motivation and creativity*. In R.J. Sternberg, *Handbook of Creativity*. New York: Cambridge University Press, 297-312.  
By helping students discover and pursue their passions, we can maximize their engagement with learning, their productivity, and their individual talents. High levels of intrinsic interest

set up conditions for creative production. One approach is to allow students to choose their own topics for projects.

Csikszentmihalyi, M. and I. Csikszentmihalyi, Eds. (1988). *Optimal experience: Psychological studies of flow in consciousness*. New York: Cambridge University Press.

Theory of flow: a state of total absorption that comes from being lost in an activity that is so satisfying that the participant loses track of time, weariness, and everything else but the activity itself. Flow requires that the participant be interested in the activity in which he or she is engaged.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper and Row.

Conditions for flow are clarity about purposes and the participant's sense that the task is within his or her capacity to act. Flow encourages the participant to seek out new challenges to grow. Interests foster skills needed to develop talent. Flow is the strongest predictor of student engagement and of how far he or she progresses in a content area.

Csikszentmihalyi, M., K. Rathunde, et al. (1993). *Talented teenagers: The roots of success and failure*. New York: Cambridge University Press.

For teenagers to become committed to developing their talents there must be a match between the complexity of tasks developed by teachers for students and the individual skill level of the students. Students whose skills are under challenged demonstrate less interest in and involvement in learning activities and a lessening of concentration. Students, whose skills are inadequate for a task, demonstrate low achievement and a lowering sense of self-worth. Teachers effective in developing talent attend to student readiness levels. A second key to talent development is student interest in the task.

Delpit, L. (1995). *Other people's children: Cultural conflict in the classroom*. New York: The New Press.

Instructional materials, curriculum, staff attitudes and beliefs, policies, teaching styles, assessment procedures, and other facets of schools may be more advantageous to members of some economic or cultural groups and disadvantageous to others. As a result teachers may misalign learning opportunities if they use the same materials and procedures with all students. This can undermine the academic success of students for whom the materials and procedures are not a match.

Fisher, C., Berliner, D. et al. (1980). *Teaching behaviors, academic learning time, and student achievement: An overview*. In C. Denham and A. Lieberman, *Time to learn*. Washington, DC: National Institutes of Education: 7-32.

There is a relationship between student achievement and a teacher's ability to diagnose the student's skill level and prescribe appropriate tasks. When students work at a high success rate, they feel better about themselves and the subject they are studying, and they learn more.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Human intelligence manifests itself in many spheres. Teaching should attend to an individual's intelligence preferences to enhance achievement.

Gilligan, C. (1982). *In different voice: Psychological theory and women's development*.

Cambridge, MA: Harvard University.

A person's gender may influence how he or she looks at and interacts with the world. When a person is socialized to act one way, and the classroom promotes a different way of interacting, a mismatch occurs and learning may be hampered.

- Grigorenko, E. (1997). "Are cognitive styles still in style?" *American Psychologist*, 52, 700-712.  
While learning preferences vary over time and place, they are probably biologically based to some degree. Matching learning style preferences and conditions of learning is one way to improve learning.
- Hennessey, B. and S. Zbikowski (1993). "Immunizing children against the negative effects of reward: A further examination of intrinsic motivation training techniques." *Creativity Research Journal* 6, 297-308.  
Student motivation can be maintained over time if adults maintain environments where learners feel free to exchange ideas and share interests.
- Howard, P. (1994). *An owner's manual for the brain*. Austin, TX: Leornian.  
Brain researchers explain that learning occurs when the learner experiences neither boredom nor anxiety—in other words, is neither over- or under-challenged.
- Hunt, D. (1971). *Matching models in education*. Ontario, CA: Institute of Studies in Education.  
More effective learning takes place when the amount of task structure provided by a teacher matches a student's level of development.
- Jackson, A. and G. Davis (2000). *Turning points 2000: Educating adolescents in the 21<sup>st</sup> century*. A report of the Carnegie Corporation. New York: Teachers College Press.  
Effective teachers in contemporary classrooms will have to learn to develop classroom routines that attend to, rather than ignore, learner variance.
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.  
Brain researchers explain that learning occurs when the learner experiences neither boredom nor anxiety and is neither over- or under-challenged.
- Jensen, A. (1998). *The g factor and the design of education. Intelligence, instruction, and assessment: Theory into practice*. R. J. Sternberg and W. M. Williams. Mahwah, NJ: Lawrence Erlbaum, 111-132.  
The best learning environments offer a large variety of choices, allowing students the opportunity to discover their interests and talents.
- Ladson-Billings, G. (1994). *The dreamkeepers: Successful teachers of African American children*. San Francisco: Jossey-Bass.  
Curriculum and instruction that matches learning style and intelligence preference of students from diverse cultures has positive impacts on learner outcomes.
- Lasley, T. and T. Matczynski (1997). *Strategies for teaching in a diverse society*. Belmont, CA: Wadsworth.

A person's culture shapes all aspects of a person's life. When a person is socialized to act one way, and the classroom promotes a different way of interacting, a mismatch occurs and learning may be hampered.

McLaughlin, M. and J. Talbert (1993). *Contexts that matter for teaching and learning: Strategic opportunities for meeting the nation's educational goals*. Stanford, CA: Center for Research on the Context of Secondary School Teaching.

Equality of opportunity only happens when students receive instruction that is suited to their needs. This enables them to maximize their growth.

Schlechty, P. (1997). *Inventing better schools: An action plan for educational reform*. San Francisco: Jossey-Bass.

The appropriate question in today's diverse classroom is not "how can I motivate students?" Rather, it is "What motivates this particular student and how do I design work that is responsive to these motivations?"

Sousa, D. (2001). *How the brain learns*. Thousand Oaks: CA, Corwin.

Students should work at a level of "moderate challenge" for optimal learning to occur.

Sternberg, R. J. (1985). *Beyond IQ: A triarchic theory of human intelligence*. New York: Cambridge University Press.

Human intelligence manifests itself in many spheres. Teaching should attend to an individual's intelligence preferences.

Tannen, D. (1990). *You just don't understand me: Women and men in conversation*. New York: Ballentine.

Gender may influence how individuals look at and interact with the world. When a person is socialized to act one way, and the classroom promotes a different way of interacting, a mismatch occurs and learning may be hampered.

Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: MIT Press.

One of Vygotsky's seminal works that discusses the idea of the Zone of Proximal Development, in which, for optimal learning to occur, students must work at a level that is just beyond the level at which they can work independently. Students need peer or adult support to succeed at the next level of challenge.

Vygotsky, L. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.

One of Vygotsky's seminal works that discusses the idea of the Zone of Proximal Development, in which, for optimal learning to occur, students must work at a level that is just beyond that which they can do independently. It is the responsibility of the teacher to create learning situations aligned with an individual's zone of proximal development and to provide support for success at that new level of challenge.

Wolfe, P. (2001). *Brain matters: Translating research into classroom practice*. Alexandria, VA: Association for Supervision and Curriculum Development.

Students should work at a level of "moderate challenge" for optimal learning to occur.

## Research that Supports Differentiation

- Beecher, M., & Sweeny, S. (2008). Closing the achievement gap with curriculum enrichment and differentiation: One school's story. *Journal of Advanced Academics*, 19(3), 502-530. The achievement gap between Caucasian students and low income students of color drastically diminished in math, reading, and writing in this elementary school that used enriched curriculum and differentiation with all students. In addition, achievement gains occurred across student groups and attitudes about school improved as well.
- Brighton, C., Hertberg, H., Moon, T., Tomlinson, C., & Callahan, C. (2005). *The feasibility of high-end learning in a diverse middle school*. Research Monograph RM05210. Charlottesville, VA: National Research Center on the Gifted and Talented. Students in differentiated middle school classrooms showed statistically significant achievement outcomes compared to students in a different treatment group and to students in a control group.
- Brimijoin, K. (2001). *Expertise in differentiation: A preservice and inservice teacher make their way*. A dissertation presented to the Curry School of Education, University of Virginia. Charlottesville, VA: University of Virginia. Evidence of strong achievement gains on a state standards test for students in an effectively differentiated elementary classroom.
- Campbell, L. & Campbell, B. (1999). *Multiple intelligences and student achievement: Success stories from six schools*. Alexandria, VA: Association for Supervision and Curriculum Development. A multiple intelligence focus in instruction leads to increased test scores. Students from varied cultural and economic groups flourish academically in such settings. Student and staff attitudes improve as well.
- Dunn, R., & Griggs, S. (1995). *Multiculturalism and learning style: Teaching and counseling adolescents*. Westport, CT: Praeger. Positive effects occur when instruction is matched to learning styles of students.
- Dunn, R. (1996). *How to implement and supervise a learning style program*. Alexandria, VA: Association for Supervision and Curriculum Development. Individuals vary in preference for conditions of learning. These preferences influence student achievement and attitude toward learning.
- Ferrier, Ann M. (2007). *The Effects of Differentiated Instruction on Academic Achievement in a Second-Grade Science Classroom*. Unpublished doctoral dissertation. Walden University. The purpose of this quasi-experimental study was to determine if utilizing differentiated instructional strategies had an impact on student achievement. Analysis of Covariance (ANCOVA) was used to determine the impact instruction using differentiated strategies had on the academic achievement of second-grade students in life science and in physical science. Students in the differentiated instructional classes were found to score significantly greater than their traditionally instructed peers.
- Gayfer, M. (1991). *The multi-grade classroom: Myth and reality: A Canadian study*. Toronto: Canadian Education Association.

Students in multi-grade classrooms (where teachers consistently address student readiness) fare better than students in classrooms with a more single-size approach to learning on measures on study habits, social interaction, cooperation, attitude toward schools, and general mental health.

Geisler, J., Hessler, R., Gardner, R., & Lovelace, T. (2009). Differentiated writing interventions for high-achieving urban African American elementary students. *Journal of Advanced Academics*, 20, 214-247.

Five high-achieving urban African American first graders with weak writing profiles had differentiated writing instruction in their regular classroom focused on two strategies, self-counting and synonym lists. The differentiation designed to improve their writing performance and enhance prospects for future academic success. All five students demonstrated improved writing outcomes in terms of both writing output and use of a broader range of words.

Grigorenko, E. and R. J. Sternberg (1997). "Styles of thinking, abilities, and academic performance." *Exceptional Children* 63, 295-312.

Learning profile adds to our understanding of students' performance and should be taken into account in classrooms in terms of both instruction and assessment. Students taught with a learning profile match outperform those taught in a more traditional manner.

Hebert, T. (1993). "Reflections at graduations: The long-term impact of elementary school experiences in creative productivity." *Roeper Review* 16(1), 22-28.

When students are interested in what they study, there is a positive impact on both short-term and long-term learning.

Hellman, D. W. (2007). *Implementing differentiated instruction in urban, Title I schools: Effects of facilitated support groups and program fidelity on student achievement*. Unpublished dissertation: University of South Florida.

This study presents the results of a mixed methodology study that investigated the effects of facilitated teacher support groups and differentiated instruction on student achievement at two urban, Title I middle schools. The researcher developed and field-tested the Differentiated Instruction: Fidelity Implementation Tool (DI: FIT) during the first year. At each of the two school sites, 13 to 15 teachers were selected to participate in the treatment group and 13 to 14 teachers in the control group. The effects of teacher use of differentiated instruction with fidelity on the reading and mathematics achievement scores of approximately 906 students were assessed using ANOVA procedures and effect sizes were calculated. Both the reading and mathematics achievement change scores and the difference in the teacher fidelity observation scores by treatment group were statistically significant. A clear relationship also existed between the teachers' mean implementation fidelity scores and the student achievement scores.

Lou, Y., P. Abrami, et al. (1996). "Within-class grouping: A meta-analysis." *Review of Educational Research*, 66, 423-428.

Students in small within-class learning groups achieve significantly more than students not learning in small groups. They also have more positive attitudes about learning and score stronger on self-concept measures. Student gains are greatest when instructional materials

are varied by need for different instructional groups rather than using the same materials for all groups.

- Marulanda, M., Giraldo, P., & Lopez, L. (2006). *Differentiated instruction for bilingual learners*. Presentation at Annual Conference of the Association for Supervision and Curriculum Development, San Francisco.  
First grade children in Colombia whose reading instruction utilized the model of differentiating content, process, and product in response to student readiness, interest, and learning profile over a four month period had fewer oral reading errors, higher comprehension scores, fewer students scoring below grade level, and more students scoring above grade level than control students.
- Rasmussen, F. (2006). *Differentiated instruction as a means for improving achievement as measured by the American College Testing (ACT)*. A dissertation submitted to the Loyola University of Chicago School of Education.  
Students in a Chicago high school receiving more instruction from a differentiated instructional methodology outperformed students receiving less instruction from a differentiated methodology on ACT English, ACT Mathematics, ACT Reading, and ACT Composite
- Renninger, K. (1990). "Children's play interests, representations, and activity." In R. Fivush and J. Hudson, *Knowing and remembering in young children*. Cambridge, MA: Cambridge University. Emory Cognition Series, Vol. 3, 127-165.  
When students are interested in what they study, there is an impact on both short-term and long-term learning.
- Sternberg, R. J. (1997). "What does it mean to be smart?" *Educational Leadership* 55(7), 20-24.  
When students are matched to instruction suited to their learning preferences, they achieve significantly better than comparable students whose instruction is not matched to their learning preferences.
- Sternberg, R., Torff, B., & Grigorenko, E. (1998). Teaching triarchically improves student achievement. *Journal of Educational Psychology*, 90, 374-384.  
Students who learned and expressed learning in preferred learning modes outperformed students who did not have that opportunity.
- Stronge, J. (2002). *Qualities of effective teachers*. Alexandria, VA, Association for Supervision and Curriculum Development.  
A summary of research shows that effective teachers in contemporary classrooms develop classroom routines that attend to rather than ignore learner variance.
- Sullivan, M. (1996). "A meta-analysis of experimental research studies based on the Dunn and Dunn learning styles model and its relationship to academic achievement." *National Forum of Applied Educational Research Journal* 10(1).  
Addressing a student's learning style through flexible teaching to address learning style results in improved achievement and attitude gains in students from a wide range of cultural groups.
- Tieso, C. (2002). *The effects of grouping and curricular practices on intermediate students'*

*math achievement*. Hartford, CT: National Research Center on the Gifted and Talented, University of Connecticut.

Achievement gains are found across economic and achievement levels through pre/post-test results for students in effectively differentiated classrooms.

Tomlinson, C. A., C. Callahan, et al. (1997). "Challenging expectations: Case studies of high-potential, culturally diverse young children." *Gifted Child Quarterly* 41(2), 5-17.

Teachers who develop primary grade classrooms with a multiple-intelligence focus demonstrate more flexibility in teaching and more student-centered instruction. These teachers developed more positive mindsets about students from low income and/or minority backgrounds.

Tomlinson, C., Brimijoin, K., & Narvaez, L (2008). *The differentiated school: Making revolutionary changes in teaching and learning*. Alexandria, VA: Association for Supervision and Curriculum Development.

Multi-year studies in an elementary school and a high school indicate positive and sustained achievement gains for students in all segments of the achievement spectrum and in a range of subject areas as a result of differentiated instruction. In the high school, the student dropout rate has also fallen sharply and student participation in Advanced Placement courses has risen by almost half, with AP exam scores holding steady or rising despite the increased enrollment. In both sites, a school-wide emphasis on differentiation has continued for at least seven years and achievement gains have continued over that time span.