

Key Sources Related to Time and Learning

Exploring Time as a Factor in Learning

Adelman, Nancy. 1996. *The Uses of Time for Teaching and Learning*. [Volume I: Findings and Conclusions]. Washington DC: Studies of Education Reform.

Assesses experiments with the quantity and quality of time in 14 schools across the country, including extended time, block scheduling, multi-age grouping and residential schools. Describes what conditions led to successful experiments

Carroll, John. (1963). A Model of School Learning. *Teachers College Record*, 64, 723-733. *Provides a theoretical model of how instructional time factors into learning. Learning is a function of the time spent on a learning task and the time that student would need to complete the task.*

Gettinger, Maribeth. 1985. Time Allocated and Time Spent Relative to Time Needed for Learning as Determinants of Achievement. *Journal of Educational Psychology*, 77 (1): 3-11.

Using Carroll's model, sets up a controlled experiment in which the time spent or time allowed to perform a learning task are less than the time a student needed. Proves that spending less time than needed results in lower rates of learning and retention.

Karweit, Nancy and Robert E Slavin. 1981. Measurement and Modeling Choices in Studies of Time and Learning. *American Educational Research Journal*, 18 (2): 157-171.

Attributes discrepancies between studies of time and learning to problems measuring time spent learning. Distinguishes between scheduled time, instructional time, and engaged time and posits that gains from increasing scheduled time will be difficult to generate without engaging students more.

Berliner, David. 1990. "What's All the Fuss About Instructional Time?" in *The Nature of Time in Schools: Theoretical Concepts, Practitioner Perceptions*. New York: Teacher College Press.

Provides a history of important theories and studies on instructional time and shows that the idea of instructional time, especially the Academic Learning Time model, is a useful tool for observing, predicting, and controlling learning behaviors.

Aronson, Julie; Zimmerman, Joy; Carlos, Lisa. 1999. "Improving Student Achievement by Extending School: Is It Just a Matter of Time?" San Francisco: WestEd.

Uses the Academic Learning Time model to analyze proposals to extend the school calendar. States that the first task for schools is to maximize ALT within the current school day and to extend the school day once in-school time is being used efficiently.

Wiley, David and Annagret Harnishfeger. 1974. "Explosion of a Myth: Quantity of Schooling and Exposure to Instruction, Major Educational Vehicles." *Educational Researcher* 3 (4): 7-12.

Attacks critics who contend that school has no effect on students, providing evidence that quantity of schooling strongly affects achievement. Amends Carroll's learning model to focus more on the specifics of school environments.

Peterson, Penelope and Susan Swing. 1982. "Beyond Time on Task: Students' Reports of Their Thought Processes During Classroom Instruction." *Elementary School Journal* 82 (5): 481-91.

Uses interviews with students to determine what thought processes during class time facilitate learning. Students who consciously used cognitive strategies and who thought motivationally performed best, outperforming those who observation suggested spent more time on-task. Suggests that cognitive strategies be taught in class.

Anderson, Lorin. 1976. "An Empirical Investigation of Individual Differences in Time to Learn." *Journal of Educational Psychology* 68: 226-233.

Sets up an experiment showing that the amount of time required to learn a task can be diminished over time if taught properly. Shows that prior inequalities in ability to learn can be reduced.

Effects of Extended Learning Opportunities

Alexander, Karl L.; Entwisle, Doris R.; Olson, Linda S. 2001. "Schools, Achievement, and Inequality: A Seasonal Approach." *Educational Evaluation and Policy Analysis* 23 (2): 171-191.

Tracks academic progress of a group of students over five years of elementary school. Finds that the achievement gap between children of high and low socioeconomic status is largely attributable to differences in gains during the summer months; the two groups learn roughly equal amounts during the school year.

Worthen, Blaine and Stephen Zsiray, Jr. 1993. "What Twenty Years of Educational Studies Reveal About Year-Round Education." Chapel Hill: North Carolina Educational Policy Research Center, University of North Carolina.

Analyzes a collection of studies examining year-round education and finds that overall, year-round education improves academic achievement, improves attendance and attitudes toward school for both students and teachers and costs the same or less than traditional school schedules.

Frazier, Julie A. and Frederick J Morrison. 1998. "The Influence of Extended-Year Schooling on Growth of Achievement and Perceived Competence in Early Elementary School." *Child Development* 69 (2): 495-497.

Sets up a controlled experiment that compares kindergarteners with traditional summer breaks to those who attend school for an additional 30 school days. Finds that the children in the extended-year program learn at an equal rate during the year but make significant gains in cognitive abilities, reading and especially mathematics over the summer.

Farmer-Hinton, Raquel. 2002. "When Time Matters: Examining the Impact and Distribution of Extra Instructional Time." In *An Imperfect World: Resonance from the Nation's Violence*. 2002 Monograph Series, Proceedings of the Annual Meeting of the National Association of Hispanic and Latino Studies, National Association of Native American Studies, and International Association of Asian Studies (Houston, TX, February 11-16).

Analyzes the Lighthouse afterschool program in the Chicago Public School system. Finds that the program is highly effective and that it does not mirror inequalities already present in the schools.

Longer Classes and the Effects on Learning

Lewis, Chance, et al. 2005. "The Effects of Block Scheduling on High School Academic Achievement." *NASSP Bulletin* 89 (645).

Compares achievement on standardized tests between schools within the same district on a traditional schedule, a 4x4 block schedule and an A/B block schedule. Finds a strong effect on reading scores for 4x4 block scheduling but few other effects of scheduling.

Deuel, Lois-Lynn Stoyko. 1999. "Block Scheduling in Large, Urban High Schools: Effects on Academic Achievement, Student Behavior, and Staff Perceptions." *The High School Journal* 83 (1): 14-25.

Compares block scheduled high schools in Broward County, FL with traditionally scheduled high schools. Finds a significant difference in the grades received in block scheduled schools and much better perceptions of the school environment.

Mattox, Kim; Hancock, Dawson; Queen, J. Allen. 2005. "The Effect of Block Scheduling on Middle School Students' Mathematics Achievement." *NASSP Bulletin* 89 (642): 3-13.

Examines the math scores of five middle schools before and after switching to block scheduling. Finds that scores are significantly higher in a block scheduling model.

Hough, David and Suzanne Bryde. 1996. *The effects of full day kindergarten on student achievement and affect.* (ERIC Document Reproduction Service No. ED 395 691). *Studies the effects of full-day kindergarten as compared to half-day kindergarten in Springfield, MO. Finds that there are unequivocal educational benefits to full-day kindergarten, that full-day kindergarten is popular among parents and teachers and that students are capable of attending school for a full day.*

Plucker, Jonathan, et al. 2004. *The Effects of Full Day Versus Half Day Kindergarten: Review and Analysis of National and Indiana Data*. Bloomington, IN: Center for Evaluation and Education Policy.

Compares the effects of full-day versus half-day kindergarten at seven sites in Indiana. Finds positive effects in all locations for full-day kindergarten and describes curricular differences between full- and half-day programs.

Imai, Mutsumi, et al. 1992. "Properties of Attention During Reading Lessons." *Journal of Educational Psychology* 84 (2): 160-173.

Examines what factors lead to inattention. Finds that the most important factor that causes inattention is the presence of mistakes when listening to another student read out loud.

Porter, Carol. "What Do I Teach for Ninety Minutes?" *Building a Successful Block-Scheduled English Classroom*. National Council of Teachers of English, 2002.

A former English department head walks through the transition from traditional scheduling to 90-minute classes in her high school. Provides advice on how to develop a new curriculum and organize a class along with extensive examples from her school.

Additional Sources:

Queen, J. Allen. *The Block Scheduling Handbook*. Corwin Press, 2003.

Gilkey, Susan and Hunt, Carla. *Teaching Mathematics on the Block*. *Teaching in the Block Series*. Eye on Education, 1998.

Marshak, David. *Improving Teaching in the High School Block Schedule*. Scarecrow Education, 2001.

Robbins, Pam; Gregory, Gayle; and Hernman, Lynne. *Thinking Inside the Box: Strategies for Teaching in Extended Periods of Time*. Corwin Press, 2000.

Comparing Instructional Time

Roth, Jodie L.; Brooks-Gunn, Jeanne; Linver, Miriam R.; Hofferth, Sandra L. 2003. "What Happens During the School Day? Time Diaries from a National Sample of Elementary School Teachers." *Teachers College Record* 105 (3) 317-343.

Uses time diaries from elementary school teachers to analyze how students spend time during school. Finds that white students are more likely to have a longer school day than African-American students and that white students are significantly more likely to have enrichment activities and recess than African-American students are.

Benavot, Aaron and Massimo Amadio. 2004. "A Global Study of Intended Instructional Time and Official School Curricula, 1980-2000." *EFA Global Monitoring Report: The Quality Imperative*: pp. 1-30.

Compares instructional hours and official curricula for grades 1-8 across country, age group and between 1980 and 2000. Examines whether ideas in education reform such as extending time or emphasizing mathematics have spread globally and how subjects are balanced across the globe.

Baker, D.; Fabrega, R.; Galindo, C.; Mishook, J. 2004. "Instructional Time and National Achievement: Cross National Evidence." *Prospects* 34(3): 311-334.

Analyzes cross-national studies of extending instructional time, finding that across countries, any correlation between instructional time and academic achievement, beyond a basic level, is weak or non-existent.

The Value-Added of Various Features of the School Day

Burton, Judith.; Horowitz, R.; Abeles, H. 1999. "Learning in and Through the Arts: Curriculum Implications." In *Champions of Change: The Impact of the Arts on Learning*. ed. Fiske, E. Chicago: MacArthur Foundation,.

Shows the impact of an arts education on cognitive skills and behavior. Suggests that arts education is a necessary partner with academic subjects in developing higher order thinking.

Wilkins, Jesse, et al. 2003. "Time in the Arts and Physical Education and School Achievement." *Journal of Curriculum Studies* 35(6): 721-734.

Looks at elementary schools in Virginia and finds no inverse relationship between time spent on the arts or physical education and achievement on standardized tests.

Waite-Stupiansky, Sandra. 2001. "The Fourth R: Recess and Its Link to Learning." *Educational Forum* 66 (1): 16-25

Summarizes research on recess' effect on students to conclude that recess is an important part of education.

Jarrett, Olga, et al. 1998. "The Impact of Recess on Classroom Behavior: Group Effects and Individual Differences." *Journal of Educational Research* 92 (2): 121- 126.

Sets up an experiment to compare the on-task behavior of students before recess and after recess when students do not know that recess is coming. Shows that recess helps behavior and reduces fidgeting.