



Findings from the National Center for Education Research: 2002-2011

Since 2002, the National Center for Education Research (NCER) has funded 591 research grants. An additional 66 grants have been awarded to support research training and capacity building in the field of education research. With this funding, tremendous advances have been made in our understanding of how best to support student academic learning, the limitations and strengths of current teacher professional development programs, and features of policies intended to improve student access to, persistence in, and completion of school. NCER has also played a central role in increasing the field's capacity to carry out high quality education research. The results of these grants are available in peer-reviewed publications, working papers, and project websites. Below, we provide some highlights of what we have learned to date, but refer interested readers to our most recent list of peer-reviewed publications that have emerged from the NCER programs of research.¹

In 2002, three programs of research were completed: the Preschool Curriculum Evaluation Research (PCER) program, the Program of Research on Reading Comprehension, and the Cognition and Student Learning program. In the ten funding cycles that have been completed since then, the range of research foci has expanded to include projects examining mathematics and science education, effective teachers and effective teaching, the social and behavioral contexts that support academic learning, techniques and strategies to improving education systems, school leadership, and organization, access and retention to postsecondary education, the use of education technology, and improving college and career outcomes for adult learners. Across these topic areas, we continue to build on our initial investments, seek to leverage important advances in our knowledge in these areas, and pursue opportunities to expand our understanding of ways to support students' success in school.

Early Learning: Improving Academic Outcomes for Young At-Risk Learners

Although economic analyses suggest that the return on investment in high quality early childhood education for children at risk for school failure can be quite large, the research base that identified characteristics of high quality early childhood curriculum was remarkably sparse in 2002. Thus, while there was evidence that early intervention had the *potential* to promote school success for many at risk learners, as seen in the results of the Abecedarian and High Scope/Perry Preschool Projects, there was very little information about the effectiveness of contemporary early childhood curricula.

¹ This document is available on the NCER website at <http://ies.ed.gov/ncer/projects/>.

Given the potential benefits of participation in early childhood education and the lack of contemporary and generalizable information, IES made the evaluation of the efficacy of early childhood curricula an initial research focus. The [Preschool Curriculum Evaluation Research Program](#) (PCER) supported twelve research teams, and the collection of common outcome data by a contractor. The PCER teams carried out small randomized controlled trials to test the efficacy of fourteen preschool curricula on child outcomes. Evaluated curricula included well-known, widely used, and comprehensive approaches such as *Creative Curriculum* and *Open Court*, as well as more recently developed targeted curricula such as *Pre-K Mathematics with DLM Early Childhood Express Math* software. The findings of the PCER projects indicated that most curricula were no better than eclectic do-it-yourself curricula at improving student outcomes. However, a few showed both statistically and practically significant effects, namely *Pre-K Mathematics with DLM Express* and *DLM Express* supplemented with *Open Court Reading Pre-K*.² The researchers also learned that typical early childhood programs did not include much mathematics or science instruction. Thus, there is an opportunity to include instruction in early childhood in the areas of mathematics and science, and demonstrated potential for improvement in student learning in these areas.

This set of findings made it clear that there was much more to be learned about the best ways to support young children's school success, and that there was a pressing need for more potent early childhood curricula. To support continued research in this area, NCER established a new program of research focused on early learning, and the IES investment in early learning programs continues to be strong. Since 2002, over 200 education research projects and R&D centers are conducting research that includes children from prekindergarten through Grade 3 (approximately \$465M). The need for and potential of interventions in the areas of the mathematics and science is reflected in more recent funding. NCER-funded researchers are currently developing and evaluating early childhood programs in science (e.g., [Early Childhood Hands-On Science](#) (ECHOS)) and mathematics (e.g., [Numbers Plus: Preschool Math Curriculum](#)). Indeed completed evaluations of mathematics interventions indicate that interventions with the strongest impact on child outcomes are those focusing on early childhood or early elementary school populations. For instance, the evaluation of *Big Math for Little Kids* indicates that students learning from this curriculum showed significant gains in their ECLS-B mathematics test scores from prekindergarten to kindergarten. Another curriculum with positive effects on the mathematics outcomes of kindergarten students at risk for mathematics difficulties is the *Early Learning in Mathematics* curriculum.³ In addition, new follow-up research of the *Building Blocks* mathematics intervention indicates that the gains seen during the preschool year are lost by the end of kindergarten

² Preschool Curriculum Evaluation Research Consortium (2008). *Effects of Preschool Curriculum Programs on School Readiness* (NCER 2008–2009). U.S. Department of Education, National Center for Education Research. Washington, DC: U.S. Government Printing Office. Available online at: <http://ies.ed.gov/ncer/pubs/20082009/>.

³ Clarke, B., Smolkowski, K., Baker, S., Fien, H., and Chard, D. (in press). The Impact of a Comprehensive Tier I Kindergarten Curriculum on the Achievement of Students At-Risk in Mathematics. *Elementary School Journal*.

if the children do not receive targeted, ongoing mathematics instruction in kindergarten.⁴ These are novel findings from NCER-funded research that provide information of relevance to practitioners, and indicate that providing high quality mathematics instruction to young learners can lead to improvements in mathematics learning.

These types of finding are of critical importance, as research conducted by IES's [National Center for Research on Early Childhood Education](#) indicate that many young children who are at-risk for school failure attend classrooms that are of mediocre quality and that do not maximize children's learning to the extent that is possible based on findings from high-quality classrooms. For example, analyses of state-funded prekindergarten programs in 11 states with mature programs indicated that a little over half of the school day was spent on learning activities.⁵ Children in early childhood classrooms may participate in very few of the types of interactions that are associated with improving school readiness.⁶ These results suggest that there is much to be done to improve early childhood education for young children in our country, and that we have evidence-based information to support improvements in practice.

Improving Reading Instruction

Research on reading has a deep history, and when IES began funding reading research, NCER was able to building upon the accumulated knowledge in the field, much of which was reflected in the National Reading Panel Report⁷ and the RAND Report on Reading Comprehension.⁸ By 2002, there was consensus in the field that learning to read depended upon acquisition of word level reading skills, reading fluency, vocabulary, and comprehension, and evidence that some targeted interventions raised students' ability to master word level reading skills. In addition, there was evidence that a range of different reading strategies improved comprehension outcomes. However, understanding how to

⁴ Clements, D., and Sarama, J. (2011). Efficacy and Effectiveness Studies of the Building Blocks Curriculum and the TRIAD Scale-up Model. Paper presented at the Society for Research on Educational Effectiveness Conference, Washington, D.C., September 8, 2011.

⁵ Early, D.M., Iruka, I.U., Ritchie, S., Barbarin, O., Winn, D., Crawford, G.M., ...Pianta, R.C. (2009). How do pre-kindergarteners spend their time? Gender, ethnicity, and income as predictors of experiences in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, 25(2), 177–193

⁶ Early et al. (2009); Mashburn, A.J., Pianta, R.C., Hamre, B.K., Downer, J.T., Barbarin, O.A., Bryant, D.,...& Early, D.M. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, 79(3), 732-749.

⁷ NICHD. (2000). National Institute of Child Health and Human Development, National Reading Panel report: *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and its Implications for Reading Instruction*. In NIH (Ed.). Washington DC: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Child Health and Human Development.

⁸ RAND Reading Study Group, Catherine Snow, Chair, (2002). *Reading for Understanding: Toward an R&D Program in Reading Comprehension*, RAND, MR-1465-OERI.

integrate these different aspects of instruction into interventions appropriate for readers of different skills and different ages was limited.

Through IES funding, targeted and intensive interventions and individualized classroom instruction strategies have been developed and evaluated. Since 2007, NCER has supported research to identify which instructional practices, programs, and interventions are effective in improving reading comprehension. As part of our Government Performance and Results Act (GPRA) process, seventeen NCER-funded practices, programs, or interventions have been reviewed according to the What Works Clearinghouse standards, and have been identified as providing evidence of improving reading outcomes. These interventions range from pull out programs intended to improve students' reading fluency or vocabulary (e.g., [Quick Reads](#)) to computerized tutors designed to support adolescents' use of comprehension strategies while reading science texts (e.g., [iSTART](#)).⁹

Another set of findings emerging from the NCER investment in reading research indicates that children bring different profiles of component reading skills to the classroom. This variability has been described in preschool learners,¹⁰ second and third graders,¹¹ and eighth and ninth graders.¹² Although many researchers and teachers are aware that young learners have tremendously variable pre-literacy and literacy skills, the demonstration of the wide variability in reading skills that remains in the adolescent years highlights the need for ongoing attention to these individual differences. This knowledge, in turn, has implications for instruction, and several teams are finding that individualizing assessment and instruction can lead to improvements in reading outcomes, especially for students who begin behind grade level.¹³

⁹ A complete list of study reports that have been evaluated according to the WWC protocols for our annual GPRA review is appended to this document.

¹⁰ Cabell, S. Q., Justice, L. M., Konold, T. R., & McGinty, A. S. (2010). Profiles of emergent literacy skills among preschool children who are at risk for academic difficulties. *Early Childhood Research Quarterly*, doi: 10.1016/j.ecresq.2010.05.003.

¹¹ Pierce, M. E., Katzir, T., Wolf, M., & Noam, G. G. (2007). Clusters of second and third grade dysfluent urban readers. *Reading and Writing*, 20, 885-907.

¹² Hock, M. F., Brasseur, I. F., Deshler, D. D., Catts, H. W., Marquis, J., Mark, C. A., & Stribling, J. W. (2009). What is the reading component skill profile of adolescent struggling readers in urban schools? *Learning Disabilities Quarterly*, 32(1), 21-38.

¹³ Al Otaiba, S., Connor, C. M., Folsom, J. S., Greulich, L., Meadows, J., & Li, Z. (2011, accepted). Assessment data-informed guidance to individualize kindergarten reading instruction: findings from a cluster-randomized control field trial. *Elementary School Journal*. ; Connor, C. M., Morrison, F. J., Fishman, B. J., Schatschneider, C., & Underwood, P. (2007). THE EARLY YEARS: Algorithm-guided individualized reading instruction. *Science*, 315(5811), 464-465. doi: 10.1126/science.1134513

The wealth of findings emerging from NCER about reading instruction has been complemented by findings that describe the components of basic reading and comprehension, and how underlying cognitive processes operate in a coordinated fashion to support reading acquisition. This in turn provides insights for developing effective interventions. For example, NCER-supported researchers have used eye-tracking technology to observe how the visual patterns of good, average, and struggling readers illustrate that struggling readers do not integrate across sentences or paragraphs when reading texts that include multiple paragraphs.¹⁴ This incoherent visual processing is related to struggling readers' poor reading comprehension outcomes, and researchers are now seeking to identify strategies to help readers' change their visual processing of the texts they read. With our recently funded [Reading for Understanding Research Initiative](#), we anticipate that this tightly linked networks of scientists and educators will be able to leverage these types of findings as they develop and evaluate instructional materials for learners in pre-kindergarten to twelfth grade.

Using Basic Science to Improve Mathematics and Science Education

As knowledge accumulates, NCER has identified places where interdisciplinary efforts to accelerate the research process may be beneficial. One of those areas is [Cognition and Student Learning](#). Through the Cognition and Student Learning program, we have supported 100 grants to bring the knowledge of learning emerging from cognitive science into the world of education practice. This highly productive program has supported a reciprocal pattern of knowledge building, where cognitive scientists have learned that their principles do not always generalize as expected when implemented in typical classroom settings, and where classroom teachers have learned that their intuitions about the best ways to support student learning are sometimes incorrect. This program has supported this conversation between two fields focused on learning, and the strides made are notable. Many of the earliest instructional practices for which evidence of efficacy in improving student outcomes in mathematics or science was available came from projects supported under the Cognition program. For example, several teams have identified ways to improve mathematics learning. One study found that when students were required to practice mathematics problems that they had learned over several weeks, as opposed to immediately after learning the to-be-practiced concept or problem-solving strategy, students remembered content that was practiced over time better than content that was practiced soon after initial learning of the concept.¹⁵ While this may seem to be a common-sense finding, an exploration of many current mathematics textbooks finds that problem sets included at the end of a chapter typically only provide practice on problems learned in the current chapter. Building on this finding, [a recently](#)

¹⁴ van den Broek, P., White, M.J., Kendeou, P., and Carlson, S. (2009). Reading Between the Lines: Developmental and Individual Differences in Cognitive Processes in Reading Comprehension. In R. Wagner (Ed.), *Biological and Behavioral Bases of Reading Comprehension* (pp. 107–123). Mahwah, NJ: Erlbaum.

¹⁵ Rohrer, D. & Taylor, K. (2006). The effects of overlearning and distributed practice on the retention of mathematics knowledge. *Applied Cognitive Psychology*, 20, 1209-1224.

[funded team](#) is exploring whether incorporating this distributed practice into homework problems included at the end of every chapter in an algebra textbook will improve student outcomes as the basic research suggests that it should. Another team found that students' performance on solving algebraic equations improved when they were asked to compare different solution methods and to identify both correct and incorrect strategies used in the compared solutions.¹⁶

The IES Practice Guide, [Organizing Instruction and Study to Improve Student Learning](#), reflects NCER's initial attempt to capture what the field knew about practices to support learning and memory.¹⁷ This guide served as a catalyst for many researchers, and forms the cornerstone of two of our current National Research and Development Centers. In one of these [Centers](#), researchers have used cognitive principles to revise two widely used sets of science instructional materials published by FOSS and Holt. The revision process is complete, and the team is now carrying out two separate efficacy studies to see if students receiving instruction from teachers using the revised curricular materials outperform students receiving instruction using the current version of those materials. In a [second center](#), a different team is using an overlapping, but not identical, set of cognitive principles to revise the *Connected Mathematics Program*, a middle school mathematics program. Once revisions are complete, they will be testing the efficacy of the revised curriculum.

Effective Teachers and Effective Teaching

The question of what makes an effective teacher is of central importance to education. Both common sense and research evidence indicate that different teachers can have different effects on student outcomes. Traditionally, teacher quality has been measured by licensure (type and score on licensure test), years of teaching experience, quality of undergraduate institution, holding of an advanced degree, and having additional certification such as National Board Certification. Some of the early NCER-supported research using longitudinal student data carried out by the [Center for Analysis of Longitudinal Data for Education Research](#) provided information about the links between these traditional quality measures and student achievement. For licensure, research has consistently found that students do worse when their teachers have provisional or emergency licenses.¹⁸ At the same time, some

¹⁶ Rittle-Johnson, B. and Star, J.R. (2007). Does comparing solution methods facilitate conceptual and procedural knowledge? An experimental study on learning to solve equations. *Journal of Experimental Psychology*, 99(3), 561–574.

¹⁷ Pashler, H., Bain, P., Bottge, B., Graesser, A., Koedinger, K., McDaniel, M., and Metcalfe, J. (2007) *Organizing Instruction and Study to Improve Student Learning* (NCER 2007-2004). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ncer.ed.gov>.

¹⁸ Clotfelter, C.T., Ladd, H.F. and J. L. Vigdor (2007a) Teacher Credentials and Student Achievement in High School: A Cross-Subject Analysis with Student Fixed Effects. CALDER Working Paper 11.; Clotfelter, C.T., Ladd, H.F. and J. L.

competitive and highly structured alternative licensure programs (such as Teach for America and New York City's Teaching Fellows) have shown similar or better impacts on student achievement as traditional approaches.¹⁹ Higher licensure test scores are linked to better student achievement, especially in math. In general, years of experience are also linked to greater student achievement, with most of the effect occurring in the first few years of teaching (although note that this finding does not hold for high school teachers). Attending a competitive undergraduate institution is also linked to better student results. Obtaining a masters degree has not been linked to greater student achievement except in one study in the case of middle school math. On the other hand, while students with teachers having National Board Certification do have greater gains, it appears that National Board Certification selects more effective teachers rather than makes them.²⁰

There is evidence, then, that many of the traditional measures used to identify teacher quality are linked to student achievement. When grouped together, the measures may have policy significant levels of impact. At the same time, these indicators do not make up the majority of the differences in teacher impacts on student achievement. Therefore the traditional measures cannot be solely relied upon to measure teacher quality. This has continued to be a focus of research funded by NCER, and there is an ongoing need to determine the other factors involved in effective teachers and effective teaching.

Within the NCER programs of research focused on teacher professional development, there has been limited success at identifying professional development programs that improve both teacher and student outcomes. However, information about the structure of curricula designed to improve reading and writing outcomes that provide explicit guidance to teachers about instructional practice are showing positive effects on both reading and writing outcomes.²¹

Postsecondary Education: Access, Persistence, and Completion

Vigdor (2007b) How and Why Do Teacher Credentials Matter for Student Achievement? CALDER Working Paper 2.; Harris, D.N, and T.R. Sass (2007). Teacher Training, Teacher Quality and Student CALDER Working Paper 3.

¹⁹ Boyd, D., Lankford, H., Loeb, S., Rockoff, J., and Wyckoff, J. (2007). The Narrowing Gap in New York City Teacher Qualifications and Its Implications for Student Achievement in High Poverty Schools. CALDER Working Paper 10.; Xu, Z., Hannaway, J., and C. Taylor (2008) Making a Difference?: The Effects of Teach for America in High School. CALDER Working Paper 17.

²⁰ Clotfelter, C.T., Ladd, H.F. and J. L. Vigdor (2007a) Teacher Credentials and Student Achievement in High School: A Cross-Subject Analysis with Student Fixed Effects. CALDER Working Paper 11.; Clotfelter, C.T., Ladd, H.F. and J. L. Vigdor (2007b) How and Why Do Teacher Credentials Matter for Student Achievement? CALDER Working Paper 2.

²¹ See Kim, J.S., Olson, C.B., Scarcella, R., Kramer, J. et al. (2011). A randomized experiment of a cognitive strategies approach to text-based analytical writing for mainstreamed Latino English Language Learners in grades 6 to 12. *Journal of Research on Educational Effectiveness*, 4(3), 231-263.

NCER-funded research in [postsecondary education](#) has focused on student access, persistence, and completion. While the postsecondary education research program is relatively young (the first projects began in 2007), two initial findings have emerged. First, access to and enrollment in postsecondary education can be increased for students who are academically qualified to attend but are not taking the steps required to enroll. This research has focused on two types of programs: 1) mentoring programs that link students to mentors who help them understand and complete the college application process and the financial aid application process (in some cases, financial incentives are also providing for specific steps in the process such as taking the SAT/ACT, completing a college application, and/or completing a FAFSA form), and 2) programs that provide assistance in completing the student aid application forms.²² Research on programs for high school students who are not yet academically prepared for postsecondary education has shown some initial promise of successful programs but not provided strong evidence of success. This work is of increasing importance given the second emerging finding regarding remediation coursework provided at postsecondary institutions.

Postsecondary institutions may attempt to mitigate student deficits during their postsecondary attendance by requiring them to complete remediation (also called developmental) courses before taking courses for credit. IES has funded a number of evaluations of remediation courses that have not found them to be highly effective at increasing postsecondary students' completion rates, community college transfers to 4 year institutions, or earnings.²³ This strand of research is leading to further work on how remediation placement policies could be improved and how remediation courses could better address students' needs. In addition, it has also led some researchers to include "need for postsecondary remediation" as an outcome to be used to evaluate interventions seeking to better prepare high school students for postsecondary education.

²² Berman, J., Ortiz, L., and Bos, J. (2011). *Promoting College Application and Enrollment Among Urban Youth*. presentation at Society for Research on Educational Effectiveness conference, March 3-6, 2011, Washington, DC.; Bettinger, E.P., Long, B.T., Oreopoulos, P., and Sanbonmatsu, L. (2010). *The Role of Simplification and Information in College Decisions: Results from the H&R Block FAFSA Experiment*. NBER Working Paper No. 15361.; Sacerdote, B. and Carrell, S. (2011) *Do Late Interventions Matter Too?: Increasing College Applications and Attendance Among High School Seniors*, presentation at Society for Research on Educational Effectiveness conference, March 3-6, 2011, Washington, DC.

²³ Boatman, A. and Long, B.T. (2010). *Does Remediation Work for All Students? How the Effects of Postsecondary Remedial and Developmental Courses Vary by Level of Academic Preparation* New York: NY: National Center for Postsecondary Education.; Calcagno, J.C., and Long, B.T. (2008). *The Impact of Postsecondary Remediation Using a Regression Discontinuity Approach: Addressing Endogenous Sorting and Noncompliance*. New York, NY: National Center for Postsecondary Research.; Martorell, Paco and McFarlin, Isaac Jr. (2011). Help or Hindrance? The Effects of College Remediation on Academic and Labor Market Outcomes. *The Review of Economics and Statistics*, 93, 436-454.

Improving Education Systems

NCER-supported research on education policy and systems covers a wide gamut of issues. At this time, the projects have not coalesced around a set of findings. Examples of the value of this work can be seen in research addressing: 1) student retention, 2) use of administrative data, and 3) policies to require college preparatory work for all high school students.

Student Retention. Prior reviews of the literature indicate that student retention is negatively associated with academic performance and dropping out of high school. However, this literature has been criticized as methodologically flawed. More recent work, including an IES funded project examining New York City's retention policy, has found positive benefits of retention (for students retained in 5th grade on their 7th grade math and ELA outcomes).²⁴ This work has raised interest in re-examining the value of retention programs (especially of the well-developed type used by NYC that provides multiple student supports) for both short-term and long-term impacts.

Using Administrative Data to Answer Policy-Relevant Questions. The quantity, quality, and availability of administrative education data at the state and district level has improved dramatically over the last decade (in part with support from IES' National Center for Education Statistics). NCER-supported research has demonstrated the value of analyzing this data. For example, the [Center for Analysis of Longitudinal Data for Education Research](#) has demonstrated how state and district-level data can be used to address research questions in such areas as teacher and governance policies affect student outcomes.²⁵ As a result of the demonstrated value of using administrative data, IES grants are now supporting a wide range of studies that have incorporated the use of administrative data, for example, examinations and evaluations of such programs as the [International Baccalaureate](#), [Tennessee's](#) expansion of its voluntary pre-kindergarten program, [Indiana's](#) use of an electronic diagnostic assessment system in reading and math, and [Michigan's](#) adoption of a more rigorous high school curriculum. An interesting offshoot of this work has been IES supported work to link other municipal administrative data to education data. For example, [a project working with Philadelphia](#), has linked social service data, elementary school administrative data, and survey data to identify eight risks that (after controlling for poverty) contribute to poor academic performance and/or behavioral problems in the third grade: lead toxicity, preterm birth, low birth weight, inadequate prenatal care, being the child of a teen mother or mother without a high school education, substantiated child maltreatment, and homelessness. The project then plotted the distribution of students with these conditions attending each of the city's 172 elementary schools noting that while some schools have many more such children they did not receive additional resources to help support their greater needs.

²⁴ Mariano, L.T. & Martorell, P. (2011). *The Academic Effects of Summer Instruction and Retention in New York City*. Santa Monica, CA: RAND Corporation.

²⁵ Working papers and descriptions of their ongoing projects are available at <http://www.caldercenter.org/>.

One approach to increasing the number of students who attend and complete postsecondary education has been to mandate college preparatory courses in high school for all students. Initially, these policies were based on observations that students who took more college preparatory courses were more successful in college. Studies evaluating the impact of policies mandating such coursework, such as an IES supported study in Chicago, did not find benefits of such a policy.²⁶ These findings showed that such policies had ignored important differences between students who would have chosen to take college-prep courses and those who would not have. As a result of this work, the latter were identified as needing additional supports in order to succeed under a more difficult curriculum. Current research is now addressing how to provide such supports.

New Investments

In closing, the federal investment in nearly 600 different education research grants since 2002 has been instrumental in building knowledge that contributes to education. This knowledge emerges from rigorous research, tackles problems of relevance to practitioners across the country, has identified areas where our knowledge base is weak, and has generated solutions to many education problems. There are many other areas in which NCER research is making strides, and this brief report only touches the surface of what we have learned. New NCER programs in the social and behavioral contexts to support academic learning, for example, are tackling problems of school discipline and school climate, programs in education technology are exploring whether technological solutions to curriculum delivery actually improve student learning, and our newest program on adult education is seeking to learn how best to support some of most needy learners. As funded projects continue to produce results, NCER will seek appropriate venues to share what is being learned.

²⁶ Allensworth, E., Nomi, T., Montgomery, N. and Lee, V. (2009). College preparatory curriculum for all: Academic consequences of requiring Algebra and English I for ninth graders in Chicago, *Educational Evaluation and Policy Analysis*, 31 (4): 367-391.

Appendix A. List of NCER-funded studies that have passed WWC review and are included in the IES Government Performance and Results Act (GPRA) review.

INTERVENTIONS WITH EVIDENCE OF EFFICACY IN IMPROVING STUDENT OUTCOMES IN READING OR WRITING.

1. (2007) O'Connor, R.E., White, A., & Swanson, H.L. (2007). Repeated reading versus continuous reading: Influences on reading fluency and comprehension. *Exceptional Children*, 74(1), 31-46.
2. (2007) Metcalfe, J., Kornell, N., & Son, Lisa K. (2007). A cognitive-science based program to enhance study efficacy in a high and low-risk setting. *European Journal of Cognitive Psychology*, 19(4), 743-768.
3. (2007) Britt, M. A., Wolfe, C. R., & Butler, J. A. (under review) Improving college students' written argumentative essays.
4. (2007) Lonigan, C. & Schatschneider, C. Open Court evaluation. Evaluation described in Preschool Curriculum Evaluation Research Consortium (2008). *Effects of Preschool Curriculum Programs on School Readiness* (NCER 2008–2009). U.S. Department of Education, National Center for Education Research. Washington, DC: U.S. Government Printing Office. Available online at: <http://ies.ed.gov/ncer/pubs/20082009/>.
5. (2007) Chambers & Slavin, R. Curiosity Corner evaluation. Evaluation described in Preschool Curriculum Evaluation Research Consortium (2008). *Effects of Preschool Curriculum Programs on School Readiness* (NCER 2008–2009). U.S. Department of Education, National Center for Education Research. Washington, DC: U.S. Government Printing Office. Available online at: <http://ies.ed.gov/ncer/pubs/20082009/>.
6. (2007) Fountain, Cosgrove & Wood. ELLM evaluation. Evaluation described in Preschool Curriculum Evaluation Research Consortium (2008). *Effects of Preschool Curriculum Programs on School Readiness* (NCER 2008–2009). U.S. Department of Education, National Center for Education Research. Washington, DC: U.S. Government Printing Office. Available online at: <http://ies.ed.gov/ncer/pubs/20082009/>.
- 7a. (2008) Coyne, M. D., McCoach, D. B., and Kapp, S. (2007). Vocabulary intervention for Kindergarten students: Comparing extended instruction to embedded instruction and incidental exposure. *Learning Disability Quarterly*, 30(2), 74–88. (Study 1)
- 7b. (2008) Coyne, M. D., McCoach, D. B., and Kapp, S. (2007). Vocabulary intervention for Kindergarten students: Comparing extended instruction to embedded instruction and incidental exposure. *Learning Disability Quarterly*, 30(2), 74–88. (Study 2)

8. (2008) Glenberg, A. M., Brown, M., and Levin, J. R. (2007). Enhancing comprehension in small reading groups using a manipulation strategy. *Contemporary Educational Psychology, 32*, 389–399.
9. (2008) McNamara, D. S., O'Reilly, T. P., Best, R. M., and Ozuru, Y. (2006). Improving adolescent students' reading comprehension with iSTART. *Journal of Educational Computing Research, 34*(2), 147–171.
- 10a. (2008) Vadasy, P. F., and Sanders, E. A. (2008). Repeated reading intervention: Outcomes and interactions with readers skills and classroom instruction. *Journal of Educational Psychology, 100*(2), 272–290.
- 10b. (2008) Vadasy, P. F., and Sanders, E. A. (2008). Benefits of repeated reading intervention for low-achieving fourth- and fifth-grade students. *Remedial and Special Education, 29*(4), 235–249.
11. (2008) Williams, J., Nubla-Kung, A., Pollini, S., Stafford, B., Garcia, A., and Snyder, A. (2007). Teaching cause–effect text structure through social studies content to at-risk second graders. *Journal of Learning Disabilities, 40*(2), 111–120.
12. (2009) Pasnak, R., Kidd, J. K., Gadzichowski, M. K., Gallington, D. A., Saracina, R. P. & Addison, K. T. (2009). Promoting early abstraction to promote early literacy and numeracy. *Journal of Applied Developmental Psychology, 30*(3), 239–249.
13. (2010) Denton, C. A., Kethley, C., Nimon, K., Kurz, T. B., Mathes, P.G., Shih, M., & Swanson, E.A. (2010). Effectiveness of a supplemental early reading intervention scaled up in multiple schools. *Exceptional Children, 76*(4), 394-416.
14. (2010) Fien, H., Santoro, L., Baker, S., Chard, D., & Park, H. (in press). Teacher read alouds enhanced with small group instruction: Closing the vocabulary and comprehension gap in first grade. *School Psychology Review*.
15. (2010) O'Connor, R. E., Swanson, H. S., & Geraghty, C. (2010). Improvement in reading rate under independent and difficult text levels: Influences on word and comprehension skills. *Journal of Educational Psychology, 102* (1), 1-19. [Study 1: intervention is read aloud at independent reading level]
16. (2011) Gonzalez, J.G., Pollard-Durodola, S., Simmons, D.C., Taylor, A.B., Davis, M.J. et al. (2011). Developing low-income preschoolers' social studies and science vocabulary knowledge through content-focused shared book reading. *Journal of Research on Educational Effectiveness, 4*, 25-52.

17. (2011) Lesaux, N.K., Kieffer, M.J., & Kelley, J.G. (under review). Effects of Academic Vocabulary Instruction for Linguistically Diverse Adolescents.

INTERVENTIONS WITH EVIDENCE OF EFFICACY IN IMPROVING STUDENT OUTCOMES IN MATHEMATICS OR SCIENCE.

1. (2007) Rohrer, D. & Taylor, K. (2006). The effects of overlearning and distributed practice on the retention of mathematics knowledge. *Applied Cognitive Psychology*, 20, 1209-1224. (Experiment 1 meets WWC standards; Experiment 2 does not)
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