National Institute for Direct Instruction

Direct Instruction, Comprehensive School Reform, and Student Achievement

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A large body of evidence has documented the effectiveness of Direct Instruction as a whole school reform model. With support from the U. S. Department of Education, Geoffrey Borman and colleagues (Borman, Hewes, Overman, & Brown, 2003) conducted a large-scale meta-analysis review of the comprehensive school reform literature. They identified 29 reform models for their analysis, all of which had at least one study of achievement effects that would allow the computation of effect sizes. To be included in the analysis a model had to have been replicated in 10 or more schools.

From an extensive literature search 232 studies of the reform models were identified. There were substantially more studies of Direct Instruction than of any other model. The median number of studies identified for the models was 4, and the median number of effect sizes found for each model was 23. In contrast, there were 49 studies of Direct Instruction (21% of the total), with 182 effects (16% of the total) (p. 141). Only seven of the 232 studies had evidence from randomized experiments, and 5 of these seven were of Direct Instruction (p. 163). Thus, there was considerably more evidence regarding the efficacy of DI than for the other models.

Using well regarded multivariate statistical techniques the authors developed estimates of the effect size associated with each model. Direct Instruction had the largest average effect (d=.21) and was one of only three programs to be given a rating of "strongest evidence of effectiveness" (p. 155). To fall within this category a model needed to have shown "statistically significant and positive achievement effects in studies using comparison groups or third-party comparison designs and have accumulated evidence from 5 third-party comparison studies (p. 161). In summarizing the evidence regarding Direct Instruction the authors stated:

> The research base for Direct Instruction (DI) is very extensive and of very good quality....DI evaluations occurred mostly in high-poverty or high-minority contexts, both urban and rural, but occasionally were conducted in less disadvantaged sites. DI evaluations have been conducted in a number of states throughout the United States, including Texas, Florida, Illinois, and California. Most of the researchers described their research methods and samples clearly and presented outcomes in excellent detail....Of the 48 studies in our analysis, most involved district comparisons or quasi-

> experimental matched-group comparison designs....The developer generated fewer than 10% of the outcomes (p. 187).

Since the completion of the Borman meta-analysis the literature regarding the efficacy of Direct Instruction has continued to grow in size. The National Institute of Direct Instruction maintains a bibliography of works regarding Direct Instruction. It lists over 80 efficacy studies published since 2002, including 12 that employed a randomized control group design. The studies involved students with a wide range of demographic characteristics, in charter and public schools, and in many areas of the United States as well as in other nations. They looked at achievement in reading, mathematics, language, and spelling, and at both short-term and long-term impacts of the programs. Like the work examined by Borman and colleagues, the results of the vast majority of these analyses replicated earlier work, finding strong and significant impacts of Direct Instruction on student achievement and school success.

Table 1 presents preliminary data from a meta-analysis of the Direct Instruction efficacy literature that is in preparation by the NIFDI Office of Research and Evaluation. It summarizes the results of 19 efficacy studies of Direct Instruction published since the report by Borman and associates. Studies included in the table were limited to those that involved general education students in the United States, paralleling the limitation used by Borman, et al. (2003). The first column of data reports the number of effect sizes calculated for each study, the next two columns contain the minimum and maximum effect for a given study and the last column reports the average effect size for the study. A total of 464 effects were calculated for the 19 studies, with an average of 24 effects per study. The average effect size ranged from -.11 to 1.13; and the overall average effect size was .35, slightly higher than that reported by Borman and associates. In short, the evidence presented by Borman and associates (2003) and the analysis of later data support the conclusion that Direct Instruction is an effective model for whole school reform.

References

Borman, G.D., Hewes, G.M., Overman, L.T., & Brown, S. (2003). Comprehensive school reform and achievement: A meta-analysis. *Review of Educational Research, 73*(2). 125-230.

National Institute for Direct Instruction. (2015). *Writings on Direct Instruction: A Bibliography*. Eugene, Oregon: National Institute for Direct Instruction.

Table 1

Studies of Whole School Implementations of Direct Instruction and Associated Effect Sizes

Citation	Number of Effects	Minimum Effect	Maximum Effect	Average Effect
Arthur, C. & Stockard, J. (2014). *An analysis of achievement scores of Arthur Academy Schools, 2007 to 2013. Technical Report 2014-2*. Eugene, OR: National Institute for Direct Instruction.	42	0.35	1.39	1.13
Butler, P. A. (2003). Achievement outcomes in Baltimore City schools. *Journal of Education for Students Placed At-Risk, 8*(1), 33-60.	60	-0.57	0.33	-0.11
Cross, R. W., Rebarber, T., & Wilson, S. F. (2002). Student gains in a privately managed network of charter schools using Direct Instruction. *Journal of Direct Instruction, 2*(1), 3-21.	46	-0.02	1.41	0.29
Crowe, E. C., Connor, C. M., & Petscher, Y. (2009). Examining the core: Relations among reading curricula, poverty, and first through third grade reading achievement. *Journal of School Psychology, 47*, 187-214.	45	0.00	0.40	0.17
Frink-Lawrence, V. (2003). *Closing the achievement gap: The implementation of Direct Instruction in Whiteville City Schools*. MS Thesis, Watson School of Education, University of North Carolina at Wilmington.	6	-0.09	0.55	0.26
Jenkins, J.A. (2013). *Effects of Direct Instruction versus Reading First on Reading Comprehension of Students in Southwest Arkansas*. Ed.D. Dissertation, Harding University, Cannon-Clary College of Education.	12	-0.19	0.68	0.33

	Number of Effects	Minimum Effect	Maximum Effect	Average Effect
Marchand-Martella, N. E., Martella, R. C., Kolts, R. L., Mitchell, D., & Mitchell, C. (2006). Effects of a three-tier strategic model of intensifying instruction using a research-based core reading program in grades K-3. *Journal of Direct Instruction, 6(1)*. 49-72.	20	-0.54	1.27	0.25
Ross, S. M., Nunnery, J. A., Goldfeder, E. McDonald, A., Rachor, R. (2004). Using school reform models to improve reading achievement: A longitudinal study of Direct Instruction and Success for All in an urban district. *Journal of Education for Students Placed at Risk, 9(4),* pp. 357-388.	9	-0.05	0.02	-0.03
Shippen, M. E., Houchins, D. E., Calhoon, M. B., Furlow, C. F., & Sartor, D. L. (2006). The effects of comprehensive school reform models in reading for urban middle school students with disabilities. *Remedial and Special Education, 27(6),* 322-328.	3	-0.14	0.15	-0.03
Stockard, J. (2008). *Reading Achievement in a Direct Instruction School and a "Three Tier" Curriculum School, Technical Report 2008-5*. Eugene, Oregon: National Institute for Direct Instruction.	55	-0.85	1.28	0.21
Stockard, J. (2010). *The impact of Reading Mastery in kindergarten on reading achievement through the primary grades: A cohort control group design*. Eugene, OR: National Institute for Direct Instruction.	2	0.30	0.49	0.40
Stockard, J. (2010). Promoting reading achievement and countering the "fourth-grade slump": The impact of Direct Instruction on reading achievement in fifth grade. *Journal of Education for Students Placed at Risk, 15*, 218-240.	4	0.11	0.30	0.20

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	Number of Effects	Minimum Effect	Maximum Effect	Average Effect
Stockard, J. (2011). Direct Instruction and first grade reading achievement: The role of technical support and time of implementation. *Journal of Direct Instruction*, 11 (1), 31-50.	20	0.00	0.81	0.27
Stockard, J. (2011) Increasing reading skills in rural districts: An Analysis of Three School Districts. *Journal of Research in Rural Education 26 (8)*, 1-19.	20	0.14	2.01	0.69
Stockard, J. (2013). *Direct Instruction in the Guam Public Schools: An analysis of changes in Stanford Achievement Test Score*s. Technical Report 2013-2. Eugene, OR: National Istitute for Direct Instruction.	2	0.43	0.44	0.44
Stockard, J. (2013). Merging the accountability and scientific research requirements of the No Child Left Behind Act: Using cohort control groups. *Quality and Quantity: International Journal of Methodology, 47*, 2225-2257.	58	0.00	1.66	0.48
Stockard, J. (2015). *Changing mathematics and reading achievement with Direct Instruction: Kment Elementary School in Roseville, Michigan*. NIFDI Technical Report 2015-1. Eugene, OR: National Institute for Direct Instruction.	30	0.13	1.28	0.58
Stockard, J. Carnine, L., Rasplica, C., Paine, S., & Chaparro, E. (2015). *The long-term impacts of Direct Instruction and the Maple Model: College Preparation and Readiness*. NIFDI Technical Report 2015-2. Eugene, OR: NIFDI.	12	0.06	0.89	0.45

Table 1, Continued, page 4

	Number of Effects	Minimum Effect	Maximum Effect	Average Effect
Vitale, M. & Joseph, B. (2008). Broadening the institutional value of Direct Instruction Implemented in a low-SES elementary school: Implications for scale-up and school reform. *Journal of Direct Instruction, 8(1), 1-18*	18	0.09	1.38	0.60