# Arthur Academy Charter Schools'
# Direct Instruction Model of Teaching

Arthur Academy charter schools specialize in a unique instructional model. It is a way of teaching that defines our charter school option. Our charter is based on the belief that a powerful and effective way of teaching exists that is not being fully utilized in schools, and therefore is being offered by our charter schools as a choice. This model involves a comprehensive approach to teaching early literacy and the fundamentals of math.

The name of this model is Direct Instruction; a trade name for a set of academic programs initially developed by Siegfried Engelmann in the 1960s. The first programs were for children in grades K-3. They have since been extended to include programs for grades K-5, with some extensions into middle school. After initially developing the K-3 programs at the University of Illinois, further research and development was carried out at the University of Oregon after 1970.

Direct Instruction (DI) includes programs designed for teaching grade level subjects for the general population and programs designed specifically for teaching more intensive and focused interventions to help students in need of catching up. Each program contains daily lessons covering a typical school year or condensed portions of yearly programs for intervention. Direct Instruction assumes that "If a student fails to learn, it is not the fault of the student, but rather the instruction".

Direct Instruction programs make up the most thoroughly documented educational reform model in elementary and middle school grades. They contain well-developed and carefully planned daily lessons designed around small sequential teaching progressions with clearly described and prescribed teaching tasks. A typical lesson includes a selection of specific tasks, timely and carefully worded demonstrations, guided oral and written practice, independent assignments and testing. These lessons are often described as: "I do, We do and You do".

All activities and examples for each lesson are very carefully analyzed and follow a sequence that can be easily learned and incorporated into more complex levels of application. What is learned is continually used and applied, with less need for review. The activities are presented in very exacting, interactive ways so that lessons are easier for children to understand.

In a successful DI program, core objectives have been broken down into very small teaching progressions. These teaching progressions are arranged incrementally so that students find learning easy and exciting but challenging. Each lesson contains only 10% to 15% new learning so that mastery is possible in each lesson. In order to progress through a program, mastery is required in each lesson so the incremental demands of new lessons can be met and won't frustrate or overwhelm the child, thus resulting in confident and successful students, learning at a fast rate. Mastery requirements and sequential programming work hand in hand in creating this model of instruction.

In short: Direct Instruction (DI) is a teaching methodology that provides students clear instruction at their skill level so they can master content and strategies that allow them to learn at a faster rate than traditional methods.

**(Basic Philosophy**: http://www.nifdi.org/what-is-di/basic-philosophy)
**(Zig Engelmann interview**: http://www.nifdi.org/what-is-di/zig-videos-on-instruction

## Three Kinds of Research used in the Creation and Evaluation of The Direct Instruction Model of Teaching

1. Whole programs, 2. Individual components, 3. Scientific classroom observations

### 1st Kind of research. The Creation, Development and Evaluation of whole programs.

The model for and the creation of Direct Instruction programs, was accomplished by Siegfried Engelmann and colleagues. According to a 1987 published report by Gersten, Carnine and Woodward, the original development of these programs "officially began in 1966 with the publication of Bereiter and Engelmann's *Teaching Disadvantaged Children in the Preschool"*. Here they argued for the importance of "developing instructional sequences that clearly and systematically teach students essential language concepts, mathematical concepts, and reading skills".

**The model** was given the brand name, **DIRECT INSTRUCTION (DI).** It's a total comprehensive educational model in that the Direct Instruction programs were drawn from "a complex way of looking at all aspects of instruction – from classroom organization and management to the quality of teacher-student interactions, the design of curriculum materials, (the desire 'to organize instruction that reduces the likelihood of student misunderstanding and student errors') and the nature of in-service teacher training." The model encompasses all that "goes on in classrooms and discerns which patterns of instruction are most effective in teaching academic content." It's cornerstone was "**the systematic, explicit teaching** of academic strategies to students". These terms anticipated their almost universal use two decades later, in the **National Reading Panel Report** of 2000, and other mainstream research literature on reading instruction.

**The DI model** has

" helped students succeed through structuring initial teaching procedures so that the teacher presentation is clear, using language and demonstrations that can be understood by all children; sequencing the content to be sure that all essential skills and knowledge are taught in an aligned and coherent manner; using teaching presentation techniques that foster a high degree of interaction between teacher and student; and providing adequate practice and review to develop high levels of fluency and accuracy. In short, it is a teaching methodology that provides students clear instruction at their skill level so they can master content and strategies that allow them to learn at a faster rate than traditional methods." (Carnine, 2004)

The 1987 Gersten report summarized **a key principle and six main features of DI programs**.

"The key principle in Direct Instruction is deceptively simple: For all students to learn, both the curriculum materials and teacher presentation of **these materials must be clear and unambiguous**. … [in how] curriculum design (or programming?) and effective teaching (presentation and delivery)… **play in concert**."

Six critical features include….

1. Explicit (direct) step-by-step strategies. (large objectives broken down into smaller components)
2. Development of mastery at each step in the process. (cumulated into larger objectives)
3. Strategy (or process) corrections for student errors.
4. Gradual fading from teacher directed activities toward independent work.
5. Use of adequate practice with a range of examples. (practiced before mastery)
6. Cumulative review of newly learned concepts." (as they build towards larger objectives)

"Direct Instruction focuses on what many consider mundane decisions: the best wording for teachers to use in demonstrating a skill, the most effective way to correct student's errors, the number and range of examples necessary to ensure mastery of a new concept. … DI programs have involved high levels of student engagement, with an academic focus, during teacher-directed lessons using sequenced methods and materials. "

**The first part of the story on research and development** is "about teacher and organizational variables like: pacing, unison oral responding, small group instruction, scripted teaching formats, strategic correction procedures, teacher signals and systematic teacher feedback and monitoring of student performance." All of this has "been documented extensively, and is reviewed and summarized

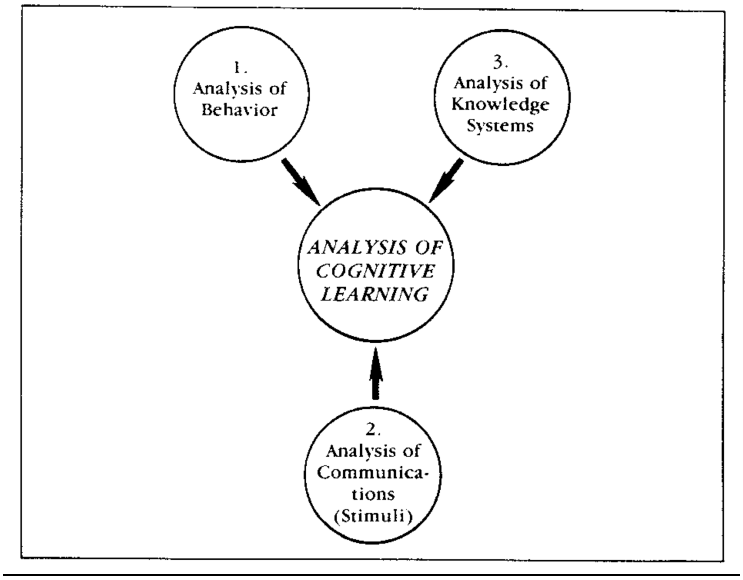
by Carnine, Silbert and Kameenui (2nd ed.,1990) in **Direct Instruction Reading**." (five editions from 1979 to 2010)

**The other part of the story** is about what distinguishes it mostly from other versions of more generic direct instruction teaching or traditional phonics teaching. This part concerns **curriculum design**, "the way the information is packaged [from lesson-to-lesson] before teacher delivery and the form in which it is made available to the learner." **Curriculum design is the**

> **"best kept secret**, ostensibly because it is the most embedded and, therefore, elusive feature. … Instructional design refers to the systematic process of translating principles of learning and instruction **into plans** for instructional materials and activities. (It is) concerned with initially preparing instruction that has a high probability of preventing learner errors and/or misconceptions and misrules….. In their text, **Theory of Instruction: Principles and Applications**, Engelmann and Carnine (1982) provided an exhaustive analysis and prescription for designing instruction that has a **high probability of preventing learner errors**. For all practical purposes, a lesson's design should maximize the clarity of a message and minimize the noise in that message. … To be clearly received, the message must be clearly communicated. " (Kameenui, 1997)

Engelmann based the construction and the design of the Direct Instruction programs on three broad analysis, as suggested by several learning theorists at the time.

Illustrated in the graph below. (Becker, 1986)




- The analysis of knowledge systems.
  - subject matter, what is to be taught.
- The analysis of communications.
  - efficient and faultless presentations: use of logical design of teaching sequences so that they will effectively transmit knowledge, preventing the learning of: (1) misrules, (2) overgeneralization to inappropriate examples, or (3) under-generalization. – making correct discriminations.
- The analysis of behavior.
  - student responses, engagement and performance: How to motivate and get attention, how to present examples, how to secure student responses, how to reinforce and correct student response.

The first programs that were published were titled **DISTAR** (Direct Instruction in the Systematic Teaching of Arithmetic and Reading) for grades k-3. These programs sought to implement the above principles and features.

In Engelmann's **Forward** to the book, **Introduction to Direct Instruction,** by Marchand-Martella, Slocum and Martella, he describes the principles used to construct the early programs.

"Our assumption from the beginning was that children would learn if we taught them effectively. When all children did not learn or didn't learn in a timely manner, the conclusion was not that they lacked readiness or were incapable of learning, but that our procedure was ineffective and should be modified to communicate more effectively with the children. Fortunately, our initial work, starting in the 1960s, was directed at accelerating the performance of preschool-age, low-performing children….. . These children were relatively hard to teach and manage, which meant that, when we succeeded in teaching skills or operations, we knew that the techniques were solid and would work with the full range of students who lacked these skills or operations."

"The overall strategy that evolved was to let these children's performance show where they could begin an instructional sequence—**a point at which we could start a small-step staircase** of skills that didn't attempt to teach everything in one "lesson", or even in a few days, but that **built progressively**, a little bit during each lesson. The idea was that, if children were able to learn only so much new information at a time, we would teach only that much. But if we designed the sequence properly on the basic skills – could learn enough to reach the next step and the next and, ultimately, reach the goal of the sequence."

"The result would be that **we would be able to teach children anything**. The trick was simply to **start them where they would be successful and to design a sequence that would not overwhelm them by trying to teach too much new material during any lesson. …."**

"In addition to being sequential and characterized by small steps, the instructional sequences had to be **scrupulously efficient**. Children at-risk are significantly behind middle-class (grade-level) children both in what they know and in their strategies about how to learn and retain information being taught to them. If these children are to catch-up, the task facing teachers is a paradox: to achieve more learning for these children during each period than the … child in a traditional program learns during the same amount of time. The paradox is that, if these children have learned at a slower-than-average rate during their entire life, and if they are relatively naïve about learning from "instructional presentations," **how is it possible to accelerate their performance so they are able to catch-up** to children who know more and learn faster. …. . If we use the same programs and techniques traditionally employed…., the children at-risk would continue to learn at a rate slower….. . So, in addition to having small steps that allow all children to learn everything we teach, the program would have to be designed so that it **packed more total learning into each lesson** than a traditional program did."

"Because there is no magic in instruction, **the advantage had to come about through design of the program** and the **various techniques** the program used. ….. . If the program was designed so that it communicated very directly and clearly to the students, the number of misinterpretations would be reduced and learning would occur faster. …."

"Eliminating the "fluff" requires a careful analysis of what children are to learn and how the introduction can be sequenced so that it involves a minimum of baggage. …The sequence must be not only small-stepped, efficient, and capable of generating responses at a high rate, but must be complete, which means that , if there is a skill component children need for a task, like initial word reading, the program must provide it. …"

"Our beginning reading program (DISTAR Reading, now titled Reading Mastery) was the first to introduce … phonemic-awareness exercises, but phonemic awareness was not an end in itself.. . (Note: it also preceded the basic research, or "discovery", on phonemic awareness done at the Haskin Laboratories that caught the attention of researchers that they ignored from the DISTAR Reading program.)

"With all these pieces in place (described further in the **Forward**), and with academic work in reading, language, and math beginning in kindergarten, we are able to accelerate the performance of children who were behind. At-risk schools are able to perform far above their current achievement levels."

**The Forward** continues with Engelmann describing how he discovered the two most important "tricks" in teaching very beginning reading: phonemic awareness by stretching out the sounds in words without stopping and sounding out words in print without stopping. These two procedures or strategies are what separates his direct instruction approach from other traditional "direct" approaches to teaching beginning decoding, yet are rarely recognized in research literature.

According to Kameenui et. al. (1997),

> "The research evidence for the effectiveness of the University of Oregon Direct Instruction Program as a **comprehensive educational model** comes in numerous forms, and is derived from **a range of research programs** (e.g. longitudinal, experimental, quasi-experimental) conducted over the last 30 years. In fact, one could persuasively argue that **the Direct Instruction model enjoys a more substantive, extensive, validate, and elaborate empirical basis than most educational approaches to teaching and learning**."

**Carnine summaries the DI model** by stating that it " helps students succeed through structuring initial teaching procedures so that the

- **teacher presentation is clear**, using language and demonstrations that can be understood by all children**;**
- **sequencing the content** to be sure that all essential skills and knowledge are taught in an aligned and coherent manner;
- **using teaching presentation techniques** that foster a high degree of interaction between teacher and student; and
- **providing adequate practice and review** to develop high levels of fluency and accuracy."

## Program Evaluation on the National Level that Gave Direct Instruction Programs Legitimacy and Credibility

The DISTAR programs for grades k-3, were rigorously field tested in the largest nationally funded research project ever conducted, entitled **Project Follow Through,** most earnestly conducted from 1967 to 1977**.** The programs were among 22 teaching approaches or sponsors that participated at some point in the Follow Through Project. **Nine major sponsors** were included in the research phase, published in 1977. Although not universally recognized as such, this project provided grounds for initial DI legitimacy and credibility. (Special Issue, ***Effect Teaching Practices***, Winter, 1996 on line: http://www.darkwing.uoregon.edu/~adiep/ft/151toc.htm )

**Project Follow Through** was designed to compare different approaches to teaching low-performing, economically disadvantaged children in the primary grades to see what works the best. Over 200,000 low-income children in 180 communities were involved in this massive project during this time. The Direct Instruction programs out-performed all other models in all of the measures reported in the 1977 published results. Several of the programs continued to be funded up through 1995.

Each sponsor conducted schools according to their particular instructional model. The DI model was described as follows….

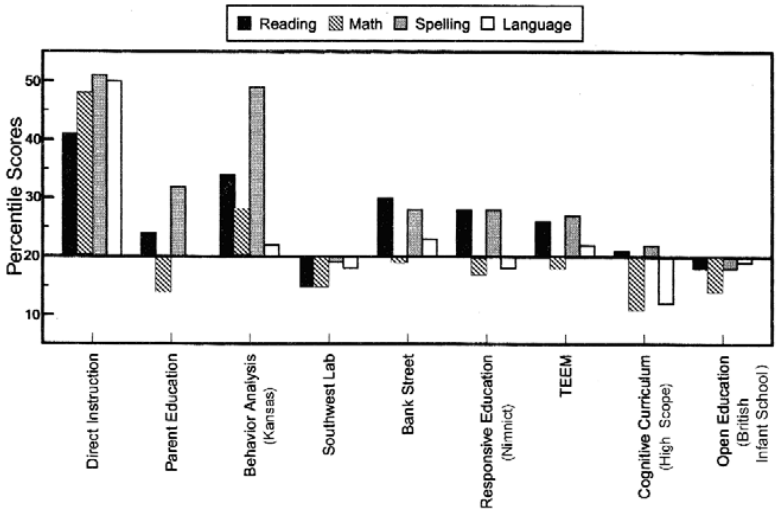
> "The Direct Instruction Model emphasized the use of small-group, face-to-face instruction by teachers and aides using carefully sequenced lessons in reading, arithmetic, and language….. They utilized advanced programming strategies which are consistent with current behavior theory, but which go beyond current research on task analysis and stimulus control… The model also emphasizes careful quality control of training procedures, teaching processes, and child progress… . Key assumptions of the model are: (1) that all children can be taught; (2) that to "catch-up", low-performing students must be taught more, not less; and (3) that the task of teaching more requires a careful use of educational technology and of time." (see Winter 1996 Special Issue, ***Effective School Practices***, )

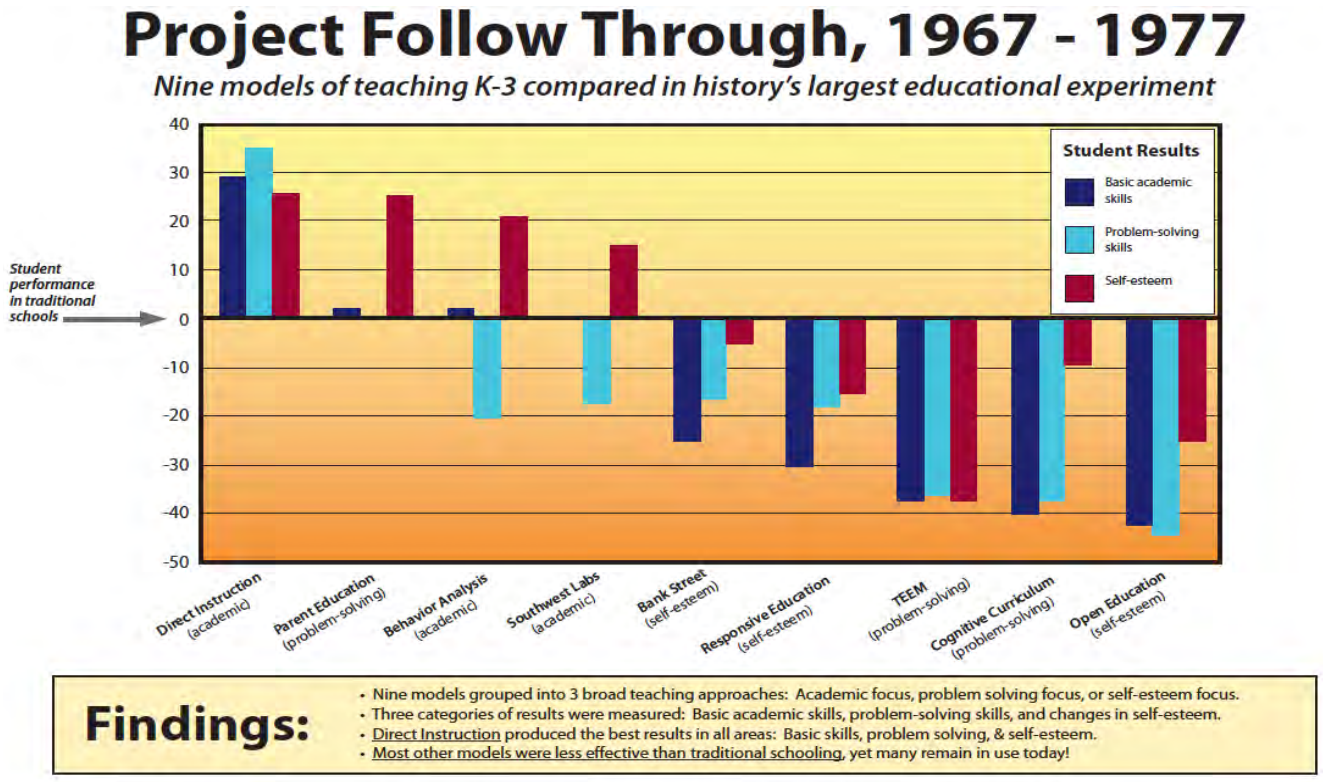
The 1977 report included measures in Basic Skills, Cognitive Skills, and Affect administered to all participants in a each of the nine major sponsors.

- **Basic Skills** included: word knowledge, spelling, language, and math computation.
- **Cognitive Skills** included reading comprehension, math concepts and math problem solving.
- **Affective measures** included cooperation, self-esteem, intellectual achievement and a responsibility scale.
  The graph below shows the outcomes for the nine major sponsors. The analysis centered around those who went through the various Follow Through programs up to third grade, 40,000 third-graders were tested. Their scores were compared to a Title I norm.

The figure below shows the performance in total reading, math and language. The twentieth percentile represented the average performance of Title I students. It was used as a measure of whether a model produced a positive or negative effect. All but two models showed some improvement from what would have been expected from Title I students.

**Percentile Comparisons for the 9 Major Follow Through Sponsors**




Source: Barbash, Shepard. *Clear Teaching: With Direct Instruction, Siegfried Engelmann Discovered a Better Way of Teaching.* The Education Consumers Foundation. http://www.education-consumers.org/ClearTeaching.htm.

S. Engelmann, Chapter 5, Follow-through, In Teaching Needy Kids, (2015), nifdi.org

Kameenui et al. (1997) summarizes the importance of the research and development of reading in particular, up to that time.

> "The research on the delivery of instruction…., and the design of instruction, coupled with the results of Project Follow Through, provide Direct Instruction reading with one of the most comprehensive and substantial empirical foundations in reading. In fact, Project Follow Through offers a logical and empirical confirmation of the instructional intervention research strand (of development) because of its planned comparisons of curriculum programs or instructional approaches, albeit in a longitudinal, large-scale, quasi-experimental design. "

In spite of the size of this project, it

> "is not recognized as a landmark study or a source of revelation about how to educate children of poverty effectively. It remains a secret, both to the public and to the educational community. In fact, its results have never been used to fashion even one urban school district, and the project has been all but erased from what serves as the current idiom of the history of compensatory education."
> (S. Engelmann, http://www.nifdi.org What is DI, 2015)

By the end of the first decade of work, those who participated in the development, implementation and dissemination of the best educational model that could be envisioned at the time for low-achieving students, expressed discouragement.

> "With the results of the independent evaluation of Follow Through (in 1977), which showed demonstrable effects for Direct Instruction, and subsequent research documenting effects with special education students, we assumed the spread of well-designed academic interventions would blossom."

However, out of this experience came new priorities in "translating research into practice, the development and refinement of sensitive, sensible in-service and professional development activities for teachers and instructional aides." (Gersten, 1987) Numerous controlled studies comparing Direct Instruction programs to non-Direct Instruction programs also continued to be conducted and reported.

For further reading on Direct Instruction and Project Follow Through see:

> **Beginnings**: http://www.nifdi.org/research/history-of-di-research/beginnings
> **Project Follow Through**: http://www.nifdi.org/research/history-of-di-research/projectfollowthrough
> **Over 40 years of Research**: http://www.nifdi.org/research/history-of-di-research/over-40-years-of-research
> **Literature Reviews**: http://www.nifdi.org/research/reviews-of-di/literature-reviews
> **Meta-Analyses of DI Programs**: http://www.nifdi.org/research/reviews-of-di/meta-analyses
> **Teaching needy kids in our backward system,**
> **http://www.zigsite.com/prologue_NeedyKids_chapter_5.html**

Reviews of various research studies on complete DI program comparisons as well as on key DI components are listed by Shepard Barbash in Clear Teaching, Appendix II, [Annotated list of] "Research on Direct Instruction", pp. 54-61, (2012), and "Reviews supporting Direct Instruction program effectiveness" (2011) by K. Hempenstall, http://www.nifdi.org/news/hempenstall-blog/403-reviews-supporting-direct-instruction-program-effectiveness. Both are available on-line.

### Evaluation of whole programs through meta-analysis comparisons.

**Engelmann-Adams** published a report in 1996 that summarized 25 years of research on Direct Instruction programs. The research studies were analyzed according to the **standard measure of the effect size**. Effect size describes the size of the different achievements between two groups. Differences favoring the experimental group would be positive. Effect sizes of at least 0.25 are considered educationally significant, 0.50 is a medium size effect size and 0.75 is considered large and rare in educational research. Differences favoring the control group over the experimental group would show as a negative number as effect size, seen in some of the Follow-Through models. .

In the Engelmann-Adams report, 34 published articles were found that met scientific criteria in the way they were conducted. Comparisons of student results, taught with Direct Instruction programs,

were made to students who were not. These 34 studies generated 173 comparisons summarized from the programs in this report. The average effect sizes for 68 selected comparisons are summarized below, according to type of students.

| | Effect Size |
|---|---|
| **Type of Student** | **Average Per Study** |
| Regular Education | 0.82 (13) |
| Special Education | 0.90 (21) |
| Overall | 0.87 (34) |

*the number of comparisons within programs are shown in parenthesis.

Of the 34 studies, 13 were conducted in reading. They generated 43 comparisons within programs. **The average effect size for reading was 0.69, favoring DI reading** .

For the sake of comparison, the average effect sizes calculated in the **National Reading Panel** report of 2000 for 38 reading studies, using a mixture of three kinds of phonics teaching: synthetic, analytic and miscellaneous others, was 0**.44**. Children in all of these groups, on the average, did better than their corresponding non-phonics control groups. The effect sizes for each kind of phonics teaching was **0.45, synthetic, 0.34, analytic and 0.27 for miscellaneous others** compared to non-phonics programs. Direct Instruction reading uses a synthetic phonics method of teaching reading.

**Seven particular programs** were highlighted in the **Panel**'s report. They had effect sizes that ranged from 0.23 to 0.73. The few smaller number of studies that included kindergarten through 2nd grade were within medium levels, k-0.56, 1st-0.54 and 2nd-0.43. Phonics programs for students at risk for reading problems were more effective in kindergarten 0.58 and grade one 0.74. They had more to gain.

A sample of single studies (not averages for groups) were highlighted in the report.

1) Jolly Phonics = 0.73. a kindergarten program developed in the UK.
2) Vanderveldon and Siegel 1997 , a kindergarten program = 0.47
3) A 2.5 year program with PA, Blachman et. al. 1999. K with PA= 0.73, 1st =0.64, 2nd grade phonics-trained = 0.36
4) An intensive 3-year tutoring program: synthetic phonics with PA vs. Embedded phonics. (Torgensen et. al. 1999) K. using Lindamood and Lindamood, auditory, Discrimination in Depth, program. Compared to a classroom control group: k.=0.33, 1st =0.75 and 2nd =0.67

**Adams and Carnine** reported on a comprehensive synthesis of approximately 300 studies that used Direct Instruction programs. (**Handbook on Learning Disabilities**, pg 403, 2003) For students in these studies that had LDs, the average effect sizes were 0**.93**, within a large standard deviation. (Fletcher and Lyons, 2007)

(also See, "**An Analysis of Achievement Scores of Arthur Academy Schools, 2007 to 2013**", by Arthur, C. & Stockard, J., a group of small k-5 charter schools using the Reading Mastery program, data base, at www.nifdi.org.)

## Evaluation through Research Reviews and Rating of Whole-School Reform Models

1. "An Educator's Guide to School-Wide Reform",
   Conducted by the American Institute of Research (AIR) in 1999 & 2005
   Direct Instruction models were one of two models for k-6 schools that received a "strong" rating.
2. "Comprehensive School Reform and Student Achievement",
   Conducted by Dr. Jeffery Borman, Univ. of Wis. 2002
   Given the Direct Instruction model a rating of Strongest evidence of effectiveness.
3. "Current Practice Alert",
   Conducted by two divisions of the Council for Exceptional Children
   Given their Highest Rating to the Direct Instruction model.

## 2nd Kind of research. Research of Instructional Components

Teaching skills "directly" is a common practice found in research studies and in use by teachers. It means that small components of reading in particular are being taught separately and explicitly rather than relying on incidental, accidental or discovery learning from various experiences in language, reading or math. It is in this sense that Stanovich makes the following statement.

> **"That direct instruction in alphabetic coding facilitates early reading acquisition is one of the most well-established conclusions in all of behavior science." Keith Stanovich, Romance and Reality.**

A review of specific instructional components found in the Reading Mastery program, has been done by Schieffer, Marchand-Martella, Martella & Simonsen, "The Research Base for Reading Mastery, Direct Instruction Reading". SRA, McGraw-Hill. (electronic copies available on request).
A very similar version was published in the *Journal of Direct Instruction*, Vol. 2, pp.87-119, "An Analysis of the Reading Mastery Program: Effective Components and Research Review."

### Components of Reading Mastery that have been independently researched and confirmed.

**Oral Language skills**: i.e. listening comprehension, word discrimination and sentence imitation, background knowledge, appreciation of stories and books, use of language to describe their experiences, to predict what will happen in the future, and talk about events that happen in the past.

**Knowledge of key language concepts**: colors, numbers, objects, shapes, letters, prepositions, word order, and classifications. Tell where, who, when, what.

**Phonemic awareness**: perceiving of words as a sequence of various sounds, isolating and segmenting individual phonemes, blending phonemes into whole words without pausing between the sounds, and rhyming.

**Decoding skills** taught systematically, explicitly and carefully sequenced: phonemes, letters, letter combinations, blended into words, isolated and in texts.
**Teach letter/sound correspondence**. Phonemic awareness in combination with letter/sound correspondences: in isolation and then blended into whole words, all resulting in increase of accurate reading rates of both regular and irregular words.
**Blend words orally** and then sound-out spellings without pausing between the sounds. Accuracy of reading words orally without sounding out is prerequisite to work on fluency.
**Providing specific and immediate feedback** to students during guided oral reading enables them to reading more accurately and consequently facilitates the comprehension of text. Clear and consistent correction procedures should be in use.

**Decoding and reading texts** At the beginning, initial texts should have words that follow regular letter/sound generalizations taught in lessons. Children taught with this approach did better that those taught with whole-language.
**Reading texts fluently must be taught**. Fluency is necessary for comprehension of text. Repeated and timed oral readings of story passages at a student's instructional level enhanced fluency.
**Effective comprehension skills**. Vocabulary, literal information, strategies for interpretation, (question answering and summarization) and reasoning within context of passages.
**Skills:** Main idea, supporting details, outlining, and reasoning skills: identifying contradictions and sarcasm.

The increased use of the generic term in a host of research studies coincided with the lengthy Follow-Through Project. This has provided added credibility for many DI features but it leaves decisions for curriculum program application based on effective instructional design principles for what is taught and incorporated into the best methods on how to teach. These principles involve analyzing and specifically identifying what needs to be taught within core subjects that can be sequenced, taught and accumulated into broad grade level objectives or into focused catch-up interventions. Daily curriculum concerns like: what to teach, when, how much, how often, how delivered, and with what materials, all need to be answered for effective teaching.

To assist in selecting the most effective programs available, additional programmatic research is then needed that compares how these broader curriculum questions are addressed and packaged into available programs for core subjects. DI programs have undergone extensive field-testing, as well as program comparisons after publication, with the use of real students and revisions, before publication. This kind of research extends beyond research on program components.

Deciding on the most effective direct teaching procedures, from the generic use of the term, is usually left up to the teacher. Mainstream research rarely identifies or endorses whole programs and therefore leaves questions of lesson-to-lesson sequencing of content and specific procedures unaddressed.

> "There is a big difference between a program based on such elements and a program that has itself been compared with matched or randomly assigned control groups" (K. Hempenstall, email 2011)

**The National Reading Panel (NRP) 2000 report**, the largest, most comprehensive review ever conducted of research on how children learn reading best, is a good example of how the generic term is used in mainstream research literature. The Panel broke down the teaching of reading into five kinds of essential skill areas: **Phonemic Awareness, Phonics, Vocabulary, Fluency and Comprehension. It broke down these areas even further by** recommending the following more explicit procedures:

- teaching children to break apart and manipulate the sounds in words (phonemic awareness)
- teaching children that these sounds are represented by letters of the alphabet which then can be blended together to form words (phonics)
- having children practice what they've learned by reading aloud with guidance and feedback (guided oral reading)
- applying reading comprehension strategies to guide and improve reading comprehension

Although the findings in the Panel Report have brought welcome focus on these essential skill areas and confirmed the validity of much of the content and procedures found in Direct Instruction reading (with the importance of systematic and explicit teaching), they still lacked the degree of specificity, even selectivity, that is needed in teaching explicitly in day-to-day lessons. The statement, ***"Systematic and explicit phonics instruction is more effective than non-systematic or no phonics instruction",*** was a part the final conclusion of the report. The terms "systematic and explicit" were in use much earlier than this report by Engelmann and Carnine in describing the Direct Instruction approach to teaching.

In spite of these lapses, there is a high level of consistency between DI and the Panel's report. The textbook, **Direct Instruction Reading** , as well as the Reading Mastery program, is organized around these five essential skill areas. The difference is in the further identification and description of subcomponents within each area, which characterizes the DI instructional model in more detail, thus "providing detailed information on how to systematically and explicitly teach the essential reading skills."
Carnine describes the difference between teaching described in the NRP report and Direct Instruction reading.

> "Most importantly, the Direct Instruction (DI) model goes further to:
>
> - Sequence the components and subcomponents to produce a seamless progression from beginning to advanced reading skills.
> - Specify effective and efficient teaching techniques and procedures to ensure that students acquire component skills and strategies and progress from beginning to advanced reading." (Carnine et al. 2004)

"In the [DI] model, components and subcomponents are sequenced and coordinated very carefully to ensure smooth transitions from phase to phase. [This] also facilitates application and generalization to a broad range of reading assignments….This careful sequencing and coordination is a critical feature of our model."
"The major difference between our Direct Instruction Model…… and the National Reading Panel's instructional recommendations, is this:

- "We specify in much greater detail both the what and the how of reading instruction."
- "The sequencing and coordination of components (i.e. curriculum design) **is the what of instruction**."
- "What teachers do to ensure that students really do learn the components as they proceed through the curriculum **is the how of instruction**. "
- (In this text) "we describe in great detail the what and the how that we believe to be effective reading instruction."

(see **Dalmatian and Its Spots**, S. Engelmann, 2004, EdWeek, http://www.zigsite.com/Dalmation.htm )

**3rd Kind of research. Teacher Effectiveness Through Scientific Observations of Classrooms**
**Teacher Effectiveness is another major line of scholarship and curriculum development** that conducted a different approach to studying teaching during the 1970s and 80s. This approach of studying teaching begins with systematic observation of students and teachers in classrooms. The approach was different but produced a similar kind of teaching found in DI programs. It seeks to identify the teaching practices and principles that are associated with, and tend to produce, high student achievement.

A large number of field studies by a variety of groups were reviewed by Jere Brophy as well as analyzed by B. Rosenshine and Stevens in the 3rd edition, 1986, **Handbook of Research on Teaching**, edited by M. C. Wittrock. Brophy identified 22 independent research groups that conducted 33 large correlational field studies of classrooms. Rosenshine has reported on many of these studies, as well as six cause-and-affect studies. (Brophy 1986 and Rosenshine 1976, 1979, 1986. google: Barak Rosenshine) In these studies, patterns emerged in classrooms, with particular teaching practices, that were consistently related to high student achievement. These teaching practices were then considered to be effective. The teaching that emerged from and described by this approach strongly resembled what is found in Direct Instruction Programs. In fact, the identified teacher behaviors have been characterized as a "direct instruction model" of teaching. Rosenshine has identified and written about six important "teaching functions" within this model. (with key distinctions from the more comprehensive Direct Instruction Model developed by Engelmann and colleagues.)

**So when studies discover what kind of teaching tend to produce high student achievement and end up describing teaching found in Direct Instruction programs, they thus provide a third kind of research support for these programs**.

Described by Carnine (2004), the Effective Teaching model includes…

"teaching in small steps with student practice after each step, guiding students during initial practice, and ensuring that all students experience a high level of successful practice….The Teacher Effectiveness practices amount to a general model, not a particular, fully elaborated program for teaching, say, reading or math."

**Some sample descriptions of direct instruction methods and practices derived from the Teacher Effectiveness studies that demonstrate similarities to DI programs.**

- "In direct instruction (di), the teacher, in a face-to-face, reasonably formal manner, tells, shows, models, demonstrates, teaches the skill to be learned. The key word is teacher, for it is the teacher who is in

command…..as opposed to having instruction 'directed' by a worksheet, learning center, or workbook" Bauman (1984)

- Direct instruction (di) means "an academic focus, precise sequencing of content, high pupil engagement, careful teacher monitoring, and specific corrective feedback to students". Duffy and Roehler (1982)
- "Direct instruction refers to academically focused teacher-directed classrooms, using sequenced and structured materials. ….. In direct instruction, the teacher controls instruction goals, chooses materials appropriate for the student's ability, and paces the instructional episodes. Interaction is characterized as structured, but not authoritarian." Rosenshine, (1979) "Yet within this task setting, the teacher is warm and convivial, frequently giving praise and encouragement to the students for academic work." Rosenshine (1976)
- Direct instruction classes have "frequent lessons in which the teacher presents information and develops concepts through lecture and demonstration, elaborates this information in the feedback given, following responses to recitation or discussion questions, prepares the students for follow up seatwork activities by giving instructions and going through practice examples, monitors progress on assignments after releasing the students to work independently, and follows up with appropriate feedback and re-teaching when necessary." Brophy (1985)

Although these studies arrive at their conclusions from a different approach, they arrive at many of the same conclusions about what constitute effective teaching found in DI programs. This is **partially due to the fact many of the observational studies over-lapped with Follow-through projects. This meant that several Follow-Through cites that used DI programs contributed to the identification of what is considered effective teaching practices in the observational studies**. This type of research has continued and has added efficacy to many of the varied principles and practices included in DI programs.

Yet, there are critical pieces missing in how the methods can be applied. They are also in the form of general principles rather than specific teaching procedures. The most important difficulty with this line of research is in applying the general principles to full programs. Because the descriptions lack examples for how methods can be put to use in complete daily lessons for teaching core subjects over the course of a school year, they fall short of a fully elaborate program for teaching. These missing pieces are where content analysis of core subjects, program design from DI theory and practice, as well as field-testing and program comparisons, extends DI beyond these studies. (Engelmann and Carnine 1991)

More descriptions of effective teaching practices found in these studies that tend to produce high achievement are available.

**Kamen'enui (1997) summarizes the importance of these studies on effective teaching and how they coincided with the development of Direct Instruction programs.**

"The cluster of attributes referenced by various researchers suggests that what was worthy of reproducing at the time was a dynamic set of teacher-directed actions. These actions generally centered on academic activities and involved the teacher communicating information to students directly and in ways that used instructional time deliberately and efficiently. As learning progressed, the teacher gradually released responsibility to students. During this guided practice and "scaffolded" phase, instruction was less direct than the initial phase of teacher-guided instruction. Clearly, direct instruction, like Direct Instruction, is teacher guided, academically oriented, goal directed, and highly intentional."

**DI vs**.di: http://www.zigsite.com/Critique_of_Lowercased_di(direct_instruction.html

In his 1979 publication, Rosenshine named what became described in his reviews as **direct instruction teaching**. He describes the kind of teaching found in these studies as….

- "… academically focused, teacher-directed classrooms using sequenced and structured materials. (not provided)
- It refers to teaching activities where **goals are clear** to students, **time allocated** for instruction is sufficient and continuous, **coverage of content is monitored**, **questions are at a low cognitive level** so that students can produce many correct responses, and **feedback to students is immediate and academically oriented**.
- In *direct instruction*, the teacher controls instruction goals, chooses materials appropriate for the student's ability, and paces the instruction episode. Interaction is characterized as structured, but not authoritarian."

The similarities to teaching in Direct Instruction programs are also obvious from Kerry Hempenstall's description of effective teaching in Chapter One of **The Introduction of Direct Instruction** by Marchand-Martella et. al. cited earlier.

> "The instructional procedure called demonstration-practice-feedback (I do, We do, You do) had strong support from this research. The deceptively simple strategy combines
>
> **Three Elements of Teaching**
>
> **First**: a sequence in which a short demonstration of the skill or academic material is followed by guided practice, during which feedback is provided to the student (and further demonstration offered if necessary).
> **Second:** usually involves response to teacher questions about the material previously presented.
> **Third:** independent practice, a feature especially important in assisting retention of knowledge and skill sequences." p. 17

Kamen'enui (1997) similarly describes the importance of what was found in the observational studies on effective teaching and how they coincide with the development of Direct Instruction programs.

"**The cluster of attributes referenced by various researchers** suggests that what was worthy of reproducing at the time was a dynamic set of teacher-directed actions.

1. These actions generally centered on academic activities and involved the teacher communicating information to students directly and in ways that used instructional time deliberately and efficiently.
2. **As learning progressed**, the teacher gradually released responsibility to students.
3. During this guided practice and "scaffolded" phase, instruction was less direct than the initial phase of teacher-guided instruction."

To implement this kind of teaching, curriculum materials are needed. Carnine states that

> "Teaching Effectiveness practices amount to a general model, not a particular, fully elaborated program, say in reading or math." (Carnine, 2010, pp. 16-19) Engelmann "made use of (these) principles for presenting curricula ….., but added to this a focus on the logical analysis of the curriculum itself, to enable unambiguous teaching and accelerated learning." (Gersten 1987)

"Clearly, direct instruction, like Direct Instruction, is **teacher guided, academically oriented, goal directed, and highly intentional**." (Kamen'enui p. 66)

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