

# ADI NEWS

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ASSOCIATION FOR DIRECT INSTRUCTION, P.O. Box 10252, EUGENE, OREGON 97440

Spring, 1988

## Research on Mastering Fractions - an Interactive Videodisc Program

by Bernadette Kelly  
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### The Curriculum

If nothing else, the research on educational change and innovation shows that it is crucial to assess and evaluate how well a new curriculum, new technology, or new model of teaching is implemented on a day-to-day basis by classroom teachers. The history of educational innovation is full of stories of conceptually elegant, complex educational models that worked well in laboratory school settings, but were never implemented in a serious, consistent fashion in public schools. In this chapter, the evolution of a new, technology based curriculum — videodisc instruction — is discussed along with an examination of its use in a range of classroom settings, from high achieving to resource room instruction.

### Development of the Program

The development of the videodisc program is best understood in the context of a long history of successful curriculum development and teacher training by its senior authors. Since 1968, Engelmann and Carnine have been involved in Project Follow Through, one of the the largest federally funded experiments in early education ever conducted. Their model — the Direct Instruction Model — was deemed highly successful in the independent evaluation (Stebbins, St. Pierre, Proper, Anderson, & Cerva, 1977). In reflecting on what led to the success of the Direct Instruction Model in enhancing student achievement, several factors recurrently stand out.

The first is a concern with instructional design, the *details* of curriculum (Engelmann & Carnine, 1982). This process focuses on what many educators might con-

sider mundane decisions: the best wording for teachers to use in demonstrating a new skill; the most effective way to correct students' errors; the most effective strategy for introducing a concept; and the number and range of examples necessary to insure mastery of a new concept.

The second concern is the close attention to teacher behavior and classroom organization. What is the appropriate pacing for a lesson? How many questions should the teacher ask students during the active teaching phase of the lesson? What is the optimal ratio of guided practice to independent seat-work activities?

Finally, a third concern that eventually distinguished Direct Instruction from many other approaches was what we call the "reality principle" a concern for developing a *feasible* classroom intervention (Gersten, Carnine, & Woodward, 1987).

Yet when the implementation of Direct Instruction over time was closely studied, Carnine (1984) concluded that in many ways, the demands that well-implemented Direct Instruction puts on the teachers were too great — in terms of both the amount and the intensity of teaching. The frustration with effective, but labor intensive instructional practices we had worked with led to technology. Technology, it appeared, offered alternative ways to increase active teaching without the excessive costs associated with training and supervision.

### Overview of the Videodisc Curriculum

In *Theory of Instruction*, Engelmann and Carnine (1982) attempt to provide a more detailed analysis of how to teach concepts and strategies effectively to students. They devote a significant portion of their book to the initial phases of instruction — the place where students are most likely to become

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## Whole Language and Direct Instruction

*Editor's Note:* In this issue we present three views of the "battle" between the Whole Language approach and Direct Instruction. One view comes from a school psychologist in Ithaca, New York (Chuck Baxter). Another comes from a principal and teacher in Canada (Terry Dodds and Fay Goodfellow). The third is by Ziggy Engelmann in Eugene. Let us know what you think.

### The Battle of the Day

*A critical analysis of the seven strategies used in the Whole Language approach as they are contrasted with some principles of Direct Instruction*

by Chuck Baxter  
School Psychologist  
Ithaca, New York

The battle of the day is to determine the approach in teaching children to read with precision. Do we teach generalizations and positive transfer of specific communications: OR do we accept approximation of the whole and promote an unobservable, "self-corrective" feedback communication, that will generate a swell of magical synthesis of understanding? I call this battle the battle between the Direct Instruction (DI) approach to general-case learning to read and the Whole Language (WL) approach.\*

In what follows, I will discuss some of the strategies emphasized by each of these approaches and the problems that may develop accordingly.

*Immersion.* Immersion is a strategy most emphasized by the Whole Language approach. Immersion may be the most visible strategy of the WL approach. The intention is to flood the classroom with a synthesis of language. The aim is an integration of skills by teaching many simultaneously. For example, teaching the child to break-the-code in reading is done in the context of meaningful content. Consequently, as the learner learns to break-the-code, he is also being taught comprehension and the structures of writing. In operation, the reading of stories to students, the access of many books, the active mixing of reading and writing are some visible examples of immersion. Immersion may have integrative advantage at certain stages of learning.

DI programs do not automatically incorporate immersion activities around all DI practices, although many are built-in. Problems could develop in some integration of skills, as in reading and spelling. In either approach, immersion largely happens as a

\* *Editor's Note:* Underlying this "battle", but not explicitly stated, is whether decoding is an essential preskill to comprehension which should be taught first.

result of the initiative of the teacher. While it is one of the first goals of the WL approach, emphasis is placed first on learning each skill by itself in the DI approach. However, I personally have never known an effective DI teacher who underrated immersion in teaching applications of skills, nor neglected to make it a very visible part of their integrated classroom operation.

*Employment.* In the Whole Language approach employment is claimed to be a more sophisticated concept than *practice*, for it has an added quality of *meaningfulness*. In other words employment means "meaningful practice". In action, this means that reading is a situation where all children are *viewed* as readers, as they are *viewed* as writers, spellers, and I suppose mathematicians, regardless of proficiency. For the less polished reader, approximations are accepted, assuming that by receiving contextual feedback (pictures and words), eventually, over a period to time, through a process of self-corrections, the reader will become proficient. The teacher operates as a kind of catalyst, who asks a series of divergent questions which are to act as an aid to the learner on their yellow brick road to self-corrective proficiency.

The counterpart to WL's employment are the DI concepts of precorrected practice of new learning, cumulative introduction of new members of a related set, and distributed review of older learning. DI precorrected practice of new learning establishes mastery with minimal errors. Cumulative programming (adding new members to a set only after previously introduced members reach criterion) insures that essential discriminations are learned. Distributed review assures retention of old learning that might be interfered with by new learning. Problems may develop where it is not acknowledged that all learners do not need the same amount of practice or review. If this difference is not recognized, some children may be held back

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## Direct Instruction Model Receives Follow Through Grant

The University of Oregon's Direct Instruction Model and four sites have been funded for a new round of the Follow Through Program (the 20th year). The emphasis of the 1988 federally funded program will be on demonstration and dissemination of effective teaching practices for low-income students. A strong educational component will make educators aware of the performance of students, and also let them know the steps involved in adopting specific program components.

The keys to effective demonstration and dissemination are well-implemented classrooms and strong local leadership. With these keys in mind, the Direct Instruction sponsor selected sites that have: a) strong leadership; b) a history of effective programs for low-income students; c) an administrative structure that is designed to provide the staff development, supervision and schedules that would be required for model implementations; and d) a strong data-based orientation to decision-making. The local sites that have been selected by the sponsor and that have been funded are Bridgeport, Connecticut, Camden, New Jersey, Dayton, Ohio and Seattle, Washington.

Key sponsor personnel are Siegfried Engelmann and Doug Carnine (co-directors), Phyllis Haddox (project coordinator), and, Russell Gersten (project evaluator and research design consultant). Acting as teacher trainers/consultants will be Jane Fineberg, Paul McKinney, and Susan Dixon.

Also funded is The Effective School Practices Model that will utilize Direct Instruction programs for the instructional component. Their sites are: Flippin, Arkansas, East Las Vegas, New Mexico and, Flint, Michigan.

The Direct Instruction News is published Fall, Winter, Spring and Summer, and is distributed by mail to members of the Association for Direct Instruction. Membership and subscription information may be found on the last page of this newsletter. Readers are invited to submit articles for publication relating to DI. Send contributions to: The Association for Direct Instruction, P.O. Box 10252, Eugene, Oregon, 97440. Copyrighted by ADI, 1988.

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## Job Opportunities

Japanese English Language School in Osaka, Japan, is looking for 5-6 outgoing Direct Instruction teachers at the elementary and high school level. University graduates in education who have T.E.S.L. experience are preferred. Preference will be given to those with recreation training. For more details please contact:

Tom Besson  
2505 Madison St.  
Eugene, Oregon 97405  
Phone (503) 683-2727

Openings for qualified teachers with dual certification, regular elementary with special education endorsement. Mountain View Elementary School is a 750-student unit of Lake Washington School District in Phoenix, Az. The school curriculum includes Reading Mastery I-VI, DISTAR Language I, Spelling Mastery A-D, Expressive Writing. Small class size, teacher aides, effective school-wide classroom management component and ongoing staff development. For information contact:

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## Jobs—Continued

Cottage Grove, Oregon needs a good Superintendent. Present one retires 7/10/88. Nice small town in beautiful environment. Budgets are hard to pass and the educational system needs to be improved. Submitted by Don Steely (concerned parent and DI author). Call (503) 942-8444 for any information I can offer. For application information contact:

South Lane School District  
455 Adams  
Cottage Grove, OR. 97424  
Phone (503) 942-3381

## Research Data on Reading Mastery Requested

There have been several requests from the field for research on using Reading Mastery (any level) with higher-performing students. If you have any relevant data please forward them, along with any other relevant information, to the Editor, ADI News, PO Box 10252, Eugene, Oregon 97440.

Our goal is to review what is sent in and make it into a story for publication in the ADI News.

Congratulations, Dr. Stein!!!

## Software Review—"Let's Learn Phonics"

by Rose Allinder  
Peabody College of Vanderbilt University

*Let's Learn Phonics* is a software program that offers teachers a management system when teaching phonics skills. It was designed for young learners and students with special needs, not as a main-line phonics instruction program for the classroom. The program allows teachers to collect and analyze data on students' performance. The data consist of the number of correct and incorrect student responses on 40 target instructional task clusters.

The targets cover the following phonic skills:

- a. Letter sounds for lower case and capital letters.
- b. Consonant-vowel-consonant words with lower case (e.g., *fed*) and capital (e.g., *Fed*) initial letters.
- c. Words containing initial (e.g., *skid*) and final (e.g., *limp*) consonant blends.
- d. Words containing a modified vowel or final-e (e.g., *fine*).
- e. Words containing digraphs (e.g., *joint*).

Target 1 teaches six letter sounds (*a m t s i f*). Target 2 teaches seven more letter sounds (*o g l h r u d*). The targets 3 through 9 apply these sounds to word reading. The program progresses through targets by introducing new words, blends, or digraphs and then word-sets to practice using them. Capital letters and the final-*e* rule are also included. The teacher can view student progress on either an individual or class basis. *Let's Learn Phonics* also offers a procedure for placing the student at the correct level in the program and for generating printouts of practice words for the students. Each target is approached at first with an emphasis on accuracy and then with an emphasis on fluency.

The program consists of five components: previous results, warm up, test, progress chart, and practice. Only two components, test and progress chart, are described as "essential"; the other three are described as "optional". The teacher would use the test

component as a probe measure to obtain information about how well the student is doing on his or her current goal. The student reads the words appropriate for that goal as they appear on the screen and the number of the correct and incorrect words read is recorded automatically by the computer. This is actuated by the teacher as she presses the "return" key if the response is correct and the space bar if incorrect. After reading the set of sounds or words, the student is shown his or her graph and sees the bar chart going up to the number correctly read. The student also sees either a smiley or frowny face, depending on his or her performance.

A major advantage of *Let's Learn Phonics* is the ability to collect, analyze, and store data for 20 individual students. It allows the teacher to use individual progress charts as well as class profiles. Other advantages are the procedure for placing students at the appropriate starting point in the program and the *printout facilities* (practice suggestions and student records). A particularly nice feature of this program is that the practice suggestions are based on each student's current performance in the program.

It should be stressed that this program can only be operated on a one-to-one basis with a teacher or aide. This severely limits it as a drill and practice or tutorial program. Another limitation is the manual which gives a minimal amount of initial directions for using the program. Teachers are left to learn how to use the software by practicing on it. Teachers may also find it necessary to add systematic review of skills taught earlier, as new skills are added.

*Let's Learn Phonics* is designed for IBM and "true compatible" computers. This is important to note because most classrooms that have computers have Apples, few have IBM or compatibles; the program did not work for reviewer when used in an IBM compatible.

Overall, *Let's Learn Phonics* is a good teacher management program for teachers who wish to individualize their phonics program.

## DI Videotapes Requested

The Association for Direct Instruction is soliciting video tapes of Direct Instruction lessons for use in Direct Instruction Workshops. We would like members to send us tapes of themselves teaching a lesson from any DI program, along with a note indicating that ADI may use the tape in workshops. ADI will promptly copy the tape and return the original to you. We are looking for tapes that do a "pretty good" job of demonstrating DI lessons with any type of students at any age group, but we do not expect (or desire) "perfect" demonstration lessons. These tapes will be of immense value to ADI. Thank you for your support.

# Whole Language—The Battle of the Day—Continued from Page 1

in learning and some may be just pushed through the tasks and not master them. The DI approach seeks to minimize errors as a route to faster learning. The WL approach, in emphasizing the role of meaning, may treat errors as correct responses. (See *Approximation* below.)

**Responsibility.** The third strategy is responsibility. The WL camp clearly places the responsibility for learning to read on the child. They confidently state that if the teacher expects all children to read, and if the learner takes responsibility in an atmosphere of immersion, self-correction, demonstration, and approximation, all will read, just as all learn to walk and talk. WL people quote psycholinguists who state that it is easier to learn to read than it is to talk, but we expect children to learn to talk. The implication is that when we expect children to learn to walk and talk we have a nation of walkers and talkers. Therefore, WL people say, it is logical to assume that the reason that we don't have "a nation of readers" is simply because we don't expect it and don't give the learner the opportunity to take responsibility for learning to read. So what happens to the third grader who is praised for guessing and is at best getting only a distorted gist of the message? This, WL people explain, is acceptable as long as the learner is taking responsibility for his improvement, or lack of it, and that he is "viewed" as a reader.

The DI protagonist, on the other hand, places the position of responsibility for learning to read on the teacher. There is a saying in the DI camp, "If the learner has not learned it, the teacher has not taught it." This means that there is no room in the DI language for explaining failure by not acknowledging it or blaming the learner. Usually, it is more common for clinicians to blame by labeling the learner, and for WL proponents just not to acknowledge failure. For example, I once heard a WL person say to me, "There is no such thing as a person who can't spell. Some spellers just spell differently." There was another circumstance where a WL advocate said to a group of teachers, "Don't be concerned about the mistakes children make in reading as long as they get the gist of it." Another WL supporter said to me once, about a nine-year-old repeating third grader, "Don't worry, this boy will read when he is ready." The DI practitioner assumes that when there is no precorrective feedback given, when the learner misinterprets relevant detail, the teacher is being an irresponsible observer watching the learner flounder in confusion.

A WL speaker once said to a group of teachers, "Don't take the ambiguity out of instruction. Life is full of ambiguity. You protect the learner from the realities of life when you eliminate these ambiguities." To the DI teacher, confusion in learning is certainly a reality, but not a reality that provides some kind of richness, but a reality that acts as a primary deterrent to understanding of a

concept. Consequently, when the WL proponents promote situations where "getting the gist of a concept" is accepted and encouraged, they may be fostering circumstances where the learner is taught mistakes that will eventually have to be unlearned. The DI teacher views it as their responsibility to precorrect for possible errors by developing flawless instructions. If the learner makes mistakes in the presence of flawless instructions, the DI teacher assumes responsibility for developing corrections based on the type of mistake the learner is making.

**Approximation.** The next strategy to be discussed is approximation. People in the WL camp state that wherever the performer exhibits any approximation to the right answer, this approximation implies competency. The DI theory explicitly recognizes when reinforcing approximations is helpful and when it is not. For example, in learning motor skills, such as cursive writing or high jumping, reinforcing better approximations will help shape progress toward the terminal response goal. Some motor responses are *better* or *poorer* than others and reinforcing the better approximations helps in improving the response. However, when identifying symbols or concepts' instances (*discrimination learning*), the responses are *right* or *wrong*. Accepting approximations (*house for horse*) is equivalent to reinforcing wrong responses and creating a need for corrective teaching. Accepting approximations in discrimination learning is most likely to occur with examples where the terms overgeneralization, undergeneralization, and misrules could be used to describe the errors.

Overgeneralization occurs where the learner judges that two similar situations are members of the same class when in reality they are not. If the learner is taught to say the sound for *n*, on encountering *m* he might say "nnnn" if the proper discrimination training is not provided. Similarly, *cop* and *cope* might both be decoded with the "short" sound for *o* without proper discrimination training. Another type of discrimination mistake is an *undergeneralization* error. In this case, the learner judges two situations as members of different classes, when in reality they're in the same class. The student is taught to read *a* and *ā* as the "short" sound of *a*, but not *a* and *ā*. When the latter are encountered they are treated as *not-a*.

The WL proponent says life is ambiguous; that we should leave these ambiguities in instruction so the learner may experience those ambiguous realities of life; that we all learn from our mistakes. It is true that in those situations where there are *consistent*, *immediate*, and *overt* consequences, we often do learn from our mistakes. However, it's very likely that in early language learning situations, where appropriate generalization is dependent on subtle discriminations between similar situations that are to be treated differently, the learner will overgeneralize. It is also logical to expect that in those sit-

uations where examples appear different that in fact are the same, where the learner is not getting consistent feedback to help to accurately identify the sameness, that the learner will more frequently undergeneralize.

Finally, where the focus is on *self-corrective* feedback, where there is no pre-corrective feedback communication system to prevent the learner from mis-cueing on irrelevant attributes of a set of examples, the learner is likely to learn a *misrule* (treat an irrelevant feature as an essential feature). For example, if in all examples of *main idea*, the main idea is stated in the first sentence or the first paragraph, the student is likely to learn the wrong concept of *main idea*, and not be able to find the main idea when it is elsewhere, or not explicitly stated at all.

**Demonstration.** Of the seven strategies that are used as guidelines in the development of the WL classroom, the demonstration strategy may be the most powerful as an aid in presenting an understanding of concepts. Demonstration is showing the learner by example what a concept is. If the concept is to develop a nation of readers, for instance, the WL teacher demonstrates reading by reading to the class or maybe independently reading a book, during students' independent reading time. If the concept is to develop writers, then during the writing hour the teacher writes during that period when the children are writing. It presents a picture to the student of reading and writing as a natural act. In this fashion the WL teacher demonstrates a picture with which the learner identifies. It becomes an action that "naturally becomes part of the learner."

For the DI teacher, the counterpart to the demonstration condition is a more *precise modeling response* and/or presenting concept examples. The DI teacher assumes that the learner has the capacity to learn any basic concept. So, by first modeling the correct response to a series of concept examples and non-example, and then leading the learner through a series of examples, the learner discriminates the critical concept features. Finally, the learner is tested to assure the teacher that the learner has achieved mastery.

In the WL environment, generalized mastery is assumed as the demonstrator's behavior is assimilated by the learner. In the DI environment modeling is more simply the initial stage of the presentation of examples of concepts or procedures.

**Feedback and correction.** The last two strategies, which were occasionally referred to earlier in this paper, are feedback and correction. As a point of reference, the correction condition is referred to as *self-correction* by the WL people and *pre-correction* or *corrective feedback* by the DI advocate.

The WL enthusiast vaguely describes feedback as something that always immediately happens irrelevant of the situation. Of course there are circumstances where the learner always receives immediate reliable feedback. For example, in learning to ride a bicycle, if the learner leans too far on a turn, something immediately happens; he falls. In the case of the learner learning to shoot baskets with a basketball, he shoots and the ball goes to the right of the target. The learner gets immediate feedback, and he accordingly adjust his shooting posture. In the case where the learner guesses wrong on a word in reading, however, the learner does not necessarily get an immediate cue for self-correction

unless a person gives it to him or her.

It is fairly well known that there are two common factors among learners who make a high frequency of mistakes while attempting to learn. One is that they are more easily confused, especially, by similar situations that are different, the other is that they are easily distracted by the irrelevant. Consequently, the fast learning student of the WL teacher, who is infrequently distracted or confused, who successfully and responsibly self-corrects by selective feedback will basically teach himself to read. It is these circumstances that make for a marvelous scene. But what of those learners who become more confused by these ambiguous situations? What is left for these children? Are they of a different sort who can't take responsibility for themselves? Are they the ones who need to be labeled so they may receive a special service for those "who are not in a position to teach themselves"? The argument for creating an environment where there is immersion, demonstration, synthesis, and congruence in learning is that it establishes a more enriching environment. But where these strategies are the primary or total focus, the dangers are blatantly apparent. At worst it becomes a process for sorting between those children who are essentially able to teach themselves and those who need to be taught. Is this what we are about in education--*sorting*?

The DI teacher, on the other hand, assumes that if there is always going to relevant, consistent feedback in academic learning, the teacher must take responsibility for providing it. S/He assumes that pre-corrected communications, communications where ambiguity is eliminated and replaced by clarity, become a most effective aid in the development of a high degree of understanding of original learning. Which in turn leads to the positive transfer of those understandings or generalizations to the learning of new generalizations. *The DI specialist views the learning of mistakes as a deterrent, not as a method of achievement* in academics. Consequently, there is a great deal of emphasis on the sufficient practice and systematic (distributive) review of carefully selected examples, both in teaching demonstrations and in the learner's independent work. Finally, in a successful DI set-up the learner exhibits a 70% first-time correct performance. Under those circumstances where the learner makes mistakes, appropriate corrective modifications are made according to the type of mistake the learner is making. These corrective procedures usually prevent the learner from making the same type of mistake in the future.

So in summary, I view us at a crossroad. What do we do? Do we, according to our orientations, retrench, reload, and attack each other from the flank? Do we wean out old generals of the opposing line by giving them early retirement, and sort out the research that supports our separate causes and present an old cause as a new line? Or do we, for a change, collaborate efforts by combining the best of each approach and develop a synthesis of models that will serve all children? If the real war is against failure and non-flourishing learning environments, isn't it possible that if these two approaches joined forces that their combined effort could win the war?

## 10th Annual Kalamazoo Direct Instruction Conference August 8-12, 1988 • Keynote Speaker—Doug Carnine

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# Integrating Whole Language With DI

by Terry Dodds, Principal  
Durrance Elementary School  
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"Ideal teachers are those who use themselves as bridges over which they invite their students to cross, then having facilitated their crossing, joyfully collapse, encouraging them to create bridges of their own." This quote from Leo Buscaglia's book, *Living, Loving, and Learning*, describes the process we hope to share with you in this article. It appears to many educators that there are at least two conflicting philosophies to teaching language arts—Whole Language and Direct Instruction. From our point of view as classroom teachers, we feel that the children are often the casualties in this "war"; but we must always put the child first. We need to adjust our instruction to ensure that children are successful, both in the school environment, and later, in the "real world", as they move forward with sufficient skills to meet the challenges of living and working in tomorrow's society.

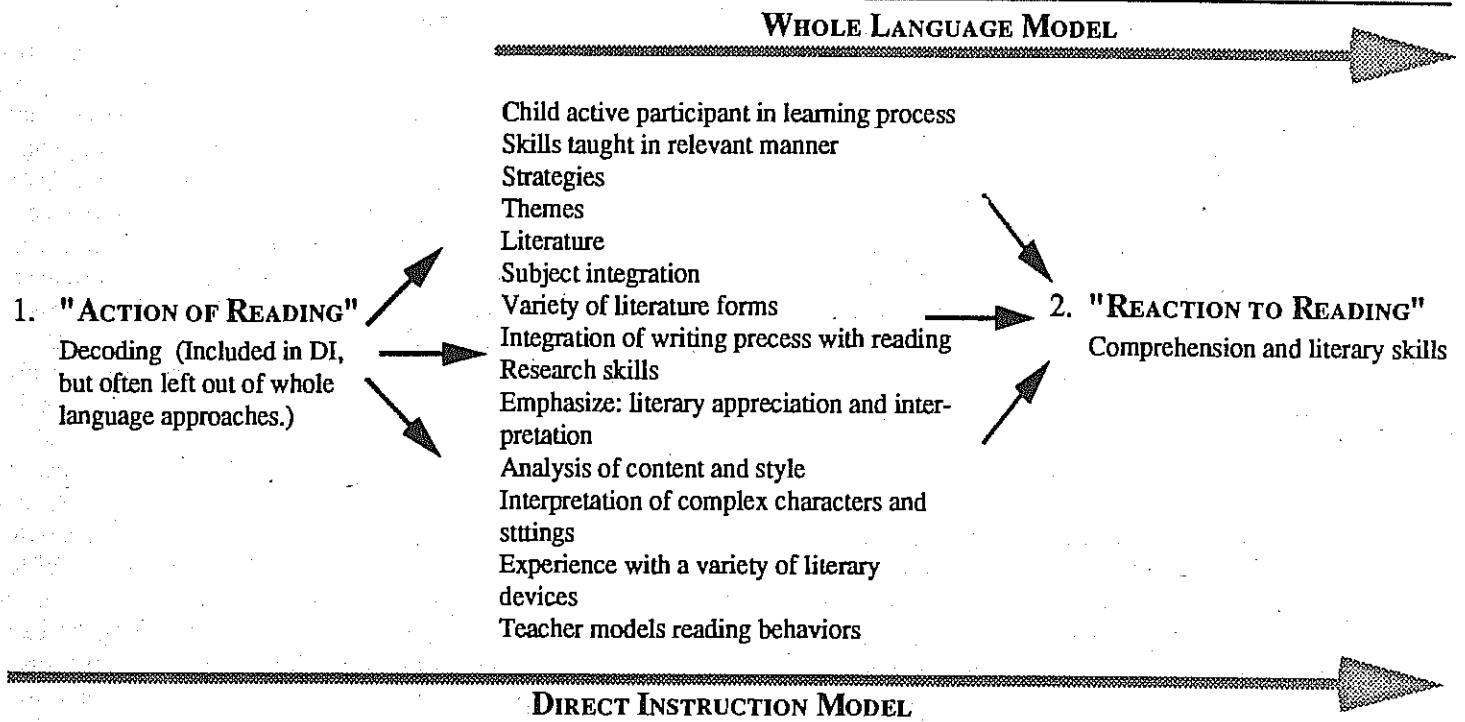
We find it difficult to disagree with the following statement made by Goodman and Watson in their article, "A Reading Program to Live With" (*Language Arts*, Volume 58). "The overall instructional program must place reading in its proper context. The instructional procedures and materials must help students focus on meaning for themselves as readers/thinkers; this is best accomplished by immersion in a total language arts program. Reading, like listening, speaking, and writing, is used to learn about the world. It is therefore important to keep reading as much a part of the total curriculum as possible, and not an isolated twenty- to sixty-minute daily lesson. When teachers keep in mind that they are teaching reading when they are focusing on social studies, science, art or literature, it helps their students understand that reading is a functional part of everything one does in a literate society."

However, our experiences have proven that if you eliminate those daily 20 - 60 minute skill lessons, many children do not ever become efficient, effective, and confident readers. We believe a total language arts program must include the specific teaching of reading skills as a part of the integrated whole. *Sequential and meaningful instruction is mandatory.*

Whole Language theory is based on children's reaction to literature. Direct Instruction's goal is to teach the action of reading, so that once children have the necessary skills they may then go on to react to what they have read, applying their knowledge and skills to new situations. Our experience with the typical Whole Language reading programs is that they begin with children reacting to print; often from listening to the teacher read the story. The students rarely have the opportunity to initiate that most important interaction between student and the written word. The reason we continue to have the Direct Instruction model as the core to our classroom programs is because it teaches the skills the children need to have in order to meet the printed page independently.

We have found no other programs to be as efficient and effective as the Direct

Figure 1. Whole Language Model without the Addition of Direct Instruction in Decoding Misses a Critical First Step.



Instruction *Reading Mastery* programs in teaching both beginning and more advanced decoding skills. For that reason, our initial primary reading programs focus almost entirely on *Reading Mastery I, II*, and the *Fast Cycle* programs, as this is the point in most children's development when their language skills are often considerably more advanced than their decoding skills. For the purpose of this discussion, we define the Action of Reading as DECODING the printed page into meaningful text to which the student can react. In most Whole Language classrooms the teacher starts the reading process by having the children react to the meaning inherent in the writing. In this process the teacher may or may not teach the specific skills necessary for the Action of Reading (Decoding), whereas the Direct Instruction teacher places these skills, at the beginning of the reading

process (see Figure 1). Once the children can successfully decode the words and sentences, the Direct Instruction teacher then continues with the necessary instruction for the children to react to what they have read, developing the necessary comprehension and literary skills needed to be literate. At the same time language comprehension is developed in the *DISTAR Language* programs. Using this approach, we believe that we now have a truly holistic approach to developing literacy—students who can both perform the action of reading, as well as effectively react to a variety of forms, including literature and content materials such as Social Studies and Science tests and manuals.

Direct Instruction teachers need not feel defensive about teaching the components found in the middle column of the diagram as being exclusive to the Whole Language

approach—these components form an integral part of *Reading Mastery* and are specifically and effectively taught.

The more experienced teacher may intuitively know that a decoding skills component must be added to the reading program. The inexperienced teacher generally "may follow the guide book," thus depriving students of the opportunity to become independent readers.

The reality of the situation is that the quality and quantity of effective instruction varies considerably from classroom to classroom. Not only must we teach students so that we are operating comfortably within our own "philosophy", but they must also have the necessary preskills to survive in the next classroom. We have an obligation to teach

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Figure 2. Long-Term Plan Using an Integrated Model

		Corrective Reading, Decoding B											
Developing Readers	Beginning Readers	Whole Language	Alison's Ghost (Novel Study)			Machines & Robots (Networks)			Good Bye Summer (Novel Study)				
	Reading Mastery IV	Toby Stories (L 1-11)	Eskimo Stories (L 12-23)		Edna and Carla (Dinosaurs) (L 24-38)	Leonard the Inventor (L 39-55)		Jupiter Stories (Space) (L 56-71)	Biology/ Science Stories (L 71-100)				
		Spelling Mastery C											
Independent Readers		All Themes across Soc. St., Sci. & Lit.	Animals	Mystery & Suspense	Innuity	Multi-culturalism	Fantasy	Machines & Transportation	Space	Biography			
	Whole Language		Alison's Ghost (Novel Study)			Secret World of Og (DI Novel Study)	King of the Wind (Novel Study)		Kidnapped in the Yukon (Novel Study)	Networks (Space Stories)			
	Reading Mastery V	The Secret Cave (L 1-5)		The Wizard of Oz (L 6-33)			A Horse to Remember (L 36-43)	Jack London Stories (L 43-59)		Jackie Robinson (L 60-70)			
		Spelling Mastery C											
		Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		

each child we meet as effectively as possible, while preparing them for the reality of situations they will be moving into. For this reason, we have chosen to integrate the skill development of Direct Instruction with the extended activities and less controlled content of the Whole Language approach. We would hope that the children we teach will have a sound skills base and the necessary attending skills which will make them effective learners in the other classroom environment to which they will be exposed. Like it or not, children need survival skills in education!!

How does one go about accomplishing this schizophrenic task of integrating Whole Language and Direct Instruction models? The answer is by careful planning and efficient use of teaching time.

We would like to share with you our long-term planning for the class Terry Dodds is currently teaching. Before embarking on long-term planning, it is important to know your class. Terry's present class consists of a split grade 4/5 classroom in a rural setting. The range of achievement on the *Canadian Tests of Basic Skills*, administered the previous spring produced scores in language arts from the 4th percentile to the 93rd percentile. *Approximately half of the students scored below the 25th percentile in language arts.* Two of the students scored above the 80th percentile on these skill-based tests. At the beginning of the year most students, including those at the higher end of the achievement scale, exhibited very poor attending skills during instruction. Many students appeared to be frustrated with the materials they were working with, and were in her opinion not experiencing much success in language arts. The focus of Terry's attention the first two to three weeks of school was on establishing proper attending skills and work habits to enable the children to successfully participate in the classroom activities as effective and efficient learners. During this time, she identified three specific groups of readers within the class; beginning readers (those with minimal decoding skills, placement testing into *Corrective Reading Decod-*

*ing B, L. 1*), developing readers (those students who had some decoding and comprehension skills, placement testing into *Reading Mastery IV*), and independent readers (those students who were competent readers, placement testing into *Reading Mastery V*). It should be noted that all groups were cross-grade groupings, having students from both grade 4 and grade 5.

As illustrated by Figure 2, you will note that the core instructional program for each group is a Direct Instruction program. *Corrective Reading B* (Decoding) is the core program for the beginning readers. They also receive instruction (with coaching) in *Reading Mastery IV*. The core program for the developing readers is *Reading Mastery IV*. The independent readers are placed in *Reading Mastery V*. Both the developing and independent readers receive specific instruction in spelling using the *Spelling Mastery Program, Level C*. The spelling program for the beginning readers is integrated into the word-attack portion of the *Corrective Reading* lessons.

The *Reading Mastery* programs themselves have a thematic approach to their planning. Terry has extended this approach to provide an integrated model, encompassing Social Studies, Science, and Literature themes. The use of themes allow the students time to internalize and apply the skills they have learned in relevant situations in content areas making language arts instruction an integral part of their school experience.

The following (and Figure 3) illustrates the contents of one of these themes, *Mystery and Suspense*.

*Reading Mastery V* contains the story *The Secret Cave* by Joyce Mann. The students' interest in this story led to the development of a mystery and suspense theme. Activities were planned in all the the four main strands of Language Arts; listening, speaking, reading, and writing. All students completed some activities in each strand. Sharing time allowed all students to benefit from each others' projects. As well, the theme provided opportunities for integration into other curriculum areas, such as Art, Math and Computer Science.

Continued -->

Figure 3. Mystery and Suspense Theme

LISTENING	(SPEAKING CONTINUED)
Jacob Two Two Meets the Hooded Fang (Richler)	• Characterization
Murder on the Canadian (Wilson)	Shared Reading
Watcher in the Woods (video)	The Visitor (Ian Serrailier)
Taped Mystery Stories (student produced)	Old Devil Wind (Bill Martin Jr.)
Audience	• Sound effects
	Brainstorm recipe for Pirate Punch
	Invitation to classes to submit art
	Plans for art show/division of tasks
	Open class bank account
	Purchase supplies for Punch
	Count and sort money earned
	Role play of auction and auctioneer
WRITING	READING
Scripts for taped mystery stories	The Secret Cave (Reading Mastery)
Anthology of class mystery stories	Alsion's Ghost
Haunted house journal	Proofreading challenge
Posters for Secret Cave	Shared reading
Art Show/Auction	The Visitor
Entry Forms	Old Devil Wind
Announcements	Bank Account forms
Letter to judges	Silent reading of self-selected materials
Thank you letters	
Bake Sales notices	
Class Bank Account- forms	
Speaking	
Taped mystery stories with sound effects	
Discussion/Analysis of TV media/print	
• Visual effects	
• Sound effects	

## Theories, Theories, Theories— A Critique of Logic of Whole Language Arguments

by Siegfried Engelmann  
University of Oregon

Most theories associated with a subject like reading are simply prejudices; and like prejudices, these theories have a strong immunity to facts or the basic cannons of science.

The International Reading Association (IRA) has historically been a consistent supporter of theories that should have been discarded before they were proposed—if we use either data or logic as a criterion for accepting a theory. Possibly, the various theories, and resulting practices, endorsed by this body are accepted because they usually flatter teachers, and at the same time, exonerate them from being responsible for student failure.

The quintessence of inadequate theories is one promulgated by Kenneth Goodman, past president of the IRA and a self-styled "linguist." Goodman's theoretical contribution is the "Whole Language" approach for teaching reading. The description of the theory is replete with romantic terms that apparently make teachers feel good all over (such as "contextual approach," "whole child," "sensitivity to the needs of the child," and "child development.") These nice words imply that anyone who fails to adopt whole language apparently doesn't care about children.

Three spokespersons for the approach (Bess Altwerger, Carole Edelsy, and Barbara Flores) lay out the logic of "whole language" in an article published in *Reading Teacher* (1987), which is the official publication of the IRA.

*The key theoretical premise for Whole Language is that, the world over, babies acquire language through actually using it, not through practicing its separate parts until some later date when the parts are assembled and the totality is finally used. The major assumption is that the model of acquisition, through real use (not through*

We want to make it very clear that we do not violate DI procedures. They were designed and then tested to be sure that they work. When using published DI materials, such as *Reading Mastery*, *Corrective Reading*, or *Spelling Mastery*, we follow the programs as published. We do not add to or delete from the formats. However, as with any experienced teacher, there are times when we wish to develop our own materials specific to the students we are teaching. In our province, the *Secret World of Og* is one of the prescribed novels. Therefore, we have developed what we call a Direct Instruction novel study which also includes extension activities which could be included in a whole language unit on Fantasy.

Our goal as classroom teachers is to provide the most efficient and effective instruction we can for all the students who are placed in our care. When they advance to the next grade, our experience has been that students have acquired the skills to build a sufficiently strong bridge that they may safely move forward, with confidence.

If you are interested in obtaining a copy of this novel study, please feel free to contact the authors of this article at PO Box 2000, Saanichton, BC, Canada, V0S 1M0.

*practice exercises*), is the best model for thinking about and helping with the learning of reading and writing and learning in general.

*Language acquisition (both oral and written) is seen as natural—not in the sense of innate or inevitably unfolding, but natural in the sense that when language (oral or written) is an integral part of functioning of a community and is used around with neophytes, it is learned 'incidentally' . . .*

*. . . Little use is made of materials written specifically to each reading or writing. Instead, Whole Language relies heavily on literature, on other print used for appropriate purposes (e.g. cake-mix directions used for really making a cake, rather than for finding short vowels), and on writing for varied purposes (p. 145).*

Where is the evidence that this approach works? There is none, despite the fact that the article quoted above is followed by nearly a full page of "references."

A close cousin to the Whole Language approach is the "open classroom," which tended to be in vogue during the '60's. Much of the same logic that characterizes the Whole Language approach served to inflate the "open classroom" approach to the status of "theory." Yet, a large-scale comparison of low-income kids showed that casualties in the "open classroom" occurred at a frightening rate. Kids received "instruction" from kindergarten through third grade, performed below the 15th percentile on a standardized test of reading achievement (Stebbins, et al., 1977; Becker & Carnine, 1980). In other words, the average "poor" kid, who went through this "treatment," was a non-reader at the end of the third grade. Of course, neither the open classroom approach, nor the Whole Language approach, believes in standardized tests.

As Altwerger et al. (1987) put it:

*Both Open Classroom and Whole Language educators oppose standardized testing. The difference in bases for their opposition is instructive. Open Classroom proponents claim that standardized tests fail to test what teachers are teaching. . . . The tests, in other words, are insignificant.*

*Whole Language educators, on the other hand, argue that the tests fail to test what the tests themselves claim to be testing (i.e. reading). That is, they are "invalid" (p. 152).*

The tests definitely have problems, a lot of them. But kids who perform below the 15th percentile, at the end of third grade, are not going to be able to demonstrate proficiency in reading in any context, "valid" or "invalid."

Aside from the lack of data is the more basic problem of rigor. Here is the argument stripped of much rhetoric:

1. Babies acquire language through actually using it, not through practicing its separate parts.
2. Written language is language.
3. Oral language is learned "incidentally."
4. Therefore, written language is best learned "incidentally."

The argument is amphibolic. It plays on the word language. And, the key assumption is that written language is language. Certainly, we can view written language as lan-

Continued on Page 6

guage, but if we can look at it from the perspective of the "neophyte" who is learning to read, written language is quite different from oral language. The learner has already mastered the basic grammar and much of the vocabulary of the oral language. Furthermore, the written language that is to be introduced is not just any old written language, but *the one that the learner already knows*. Therefore, no new grammar is to be learned (at least for the introduction to reading) and no new words are to be learned.

In addition, the learning of initial written language is analogous to only one aspect of oral language (not oral language in all its manifestations), which is: statement repetition. If we were to tell the learner, "Say this: *The horse is brown*," we would have taken oral language about as close as we can get to the task of having the student orally read the sentence: *The horse is brown*. The only difference is the source of the statement that is to be repeated. For reading, it's the squiggles on the page, which the learner transforms and orchestrates into the appropriate sounds. When the learner reads silently, the oral-language analogue is "listening." But initially, the learner (hopefully) will read out loud and will read a language he understands.

The standards, or criteria, for judging the adequacy of the oral reading are the same as those for judging adequacy of the statement-repetition task. If the learner reads, "The house is brown," the attempt is wrong, just as it would be wrong if the learner responded that way to an oral statement-repetition task.

The new learning required for reading is therefore very narrow and unique—unlike anything experienced by the learner before. The learner must learn a system for decoding arrangements of written symbols. Since the learner has never done anything like this before, we can't argue from analogy, because there is none. We can't use information about how the learner acquires oral language and then extrapolate, because the reading task doesn't actually involve learning a new language, only a system for expressing a familiar language.

So the entire argument is spurious. If we want to know what the best methods are for introducing reading, we should look at different methods for introducing reading, in which case NO teacher seriously interested in kids would use Whole Language.

But, just as an exercise, let's consider the other points in the argument:

**Premise 1:** Babies acquire language through actually using it, not through practicing separate parts. Wrong. Babies babble "Da da do do." That babbling is practicing a part—the sounds, the clumps, the patterns. We could point out other separate parts that the little guys practice, but more to the point is the fact that the premise begs the question. Oral language is a skill. The only arena for applying the skill is producing verbalizations or responding to verbalizations. So it is impossible for babies to practice without using it. When the mother says, "Can you touch your nose?...Oh yes, touching your nose," the baby is practicing language and using it (even though no words are coming from the little guy's mouth).

Another way of looking at this premise is like this: The baby doesn't start out with language. When the baby learns language, it

doesn't emerge as a lump with the kid suddenly knowing everything he is to know about language. Instead, it unfolds a *discrete* skill at a time. It follows that the learner must have practiced "separate parts," because that's all the baby learns—separate parts.

**Premise 2:** Oral language is learned "incidentally." This premise also begs the question. Oral language is used with infants only to refer to things in the infant's world. If "incidental" means that something is part of various other activities, and if language applies only to various other activities, the word "incidental" is misleading. How else could the learner practice language, other than label things (doggie), respond to internal states (potty), and so forth? To practice language is to apply it to situations, which means that any kind of "language" instruction the baby receives would perforce be "incidental" because the language would focus on some activity or situation.

The conclusion of the "Whole Language" argument is: "Written language is best learned incidentally." Incredible! Not merely preposterous, or outrageous, but incredible. As noted above, learning reading is unique—different. Also, the skill level of the learner is different—attention span, ability to respond to verbal instruction, knowledge. Finally, the setting is different—possibly 30 kids and one teacher. So let's say that some misguided soul was so convinced by the rhetoric of the "Whole Language" approach that he decided to teach reading in a manner that is analogous to the way babies actually learn language. The teacher would spend time individually with the kids. After all, the early training of babies is pretty much a one-to-one game, often with two parents and possibly some older siblings engaged in the teaching and reinforcement. If we don't provide instruction or "usage" individually, we're pretty much destroying the only remaining threads of the analogy between written and oral language. A teacher wise enough to take a calculator and put in some simple numbers quickly discovers that one can't really teach reading in a way that is analogous to initial language learning. If the teacher worked *individually* with each kid for ten minutes—just ten minutes, compared to the hours of interaction and feedback that babies receive from their parents—the teacher would spend five hours a day on reading (10 minutes times 30 children), and yet each student would receive a paltry ten minutes of "usage".

Therefore, the teacher cannot use the individualized format. Instead, the teacher will present contrived activities, such as making a cake, and tell herself that *all* children are interested in it. But the teacher is making up fibs, and is not providing the type of feedback or interactions that are even remotely analogous to the ones an infant receives when learning to use *oral language* "incidentally." Also, the teacher has gone from one meaning of "incidental" to another. When *oral language* is used incidentally, it is an *ongoing adjunct to whatever activity the baby engages in*. The toddler grabs a cup from the coffee table and the mother responds. The toddler says "up," and the mother responds. The baby smiles and the mother responds. And so forth. Compare this interaction with the cake-mix routine, where all we have are some sterile words on

a piece of paper, with no direct interaction between the words and the activity. The teacher is not running around holding up signs that say, "You poured more than one cup," or "No, no. Set the oven at 375." Instead, the teacher is using "oral language," not "written language." In this situation, "incidental" means that the *written language* is an *unnecessary part of the activity*, an add-on, quite different from the "incidental" use of language by "babies the world over."

In summary, the Whole Language argument is a study in fantasy. The argument is simple-minded, at best. Yet, in states like California, Washington, and Arizona, Whole Language is the big thing. The National Council of English teachers have a strong investment in it (which may demonstrate that these folks don't know very much about either language or logic). And the approach is actually treated as a serious approach, even though it doesn't have a shred of evidence to support the notion that it works well, let alone that it is the "best" approach.

But the most disturbing aspect of the Whole Language orientation is the lack of empathy with kids. On the surface are buzz words that imply concern about nurturing the whole child. Even a casual analysis, however, reveals an almost unbelievable lack of ability to look directly at James and Linda as human beings and to empathize with the problems they'll encounter in learning to read. These problems are very specific and

can be obviated only through a hard-minded approach to analysis of the problem, not festoons of rhetoric. To arrange instruction so all kids learn, learn well, and also learn that they are smart, is not achieved if the teacher simply emotes and puts together a montage of activities that happen to excite her. What excites her is perfectly irrelevant. If she's a pro, she'll convey the idea that she's excited about those activities that will effectively teach James and Linda. And, if she doesn't have this orientation, we should encourage her to leave the classroom before we permit her to teach in a manner that is sloppy and ineffective (unless we think it's all right for her to pursue her interests at the expense of our kids). But understand, that's exactly what it's all about. The reason "Whole Language" is a big thing has nothing to do with fact or logic. It is based on what a lot of teachers "like."

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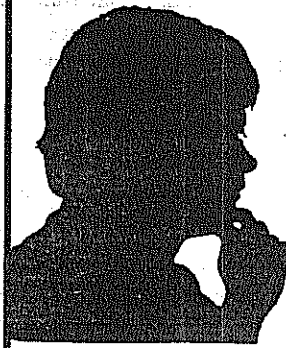
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# Research on Mastering Fractions — Continued from Page 1

confused and misunderstand what is being taught. By controlling the number and type of examples presented; by providing detailed, step-by-step instruction fashioned on specific problem solving strategies; and by incorporating strategy-based correction procedures, instruction can be successful for a much wider range of students. This work has been comprehensively reviewed (e.g., Moore, 1986) and supported by an appreciable amount of empirical research. This work has been seen by some (Brophy & Good, 1986; Tarver, 1986) as a necessary adjunct to the research on effective teaching.

In considering which technology would best support Engelmann and Carnine's principles of instructional design, the videodisc was chosen. The graphics and sound capabilities of the medium were a primary consideration, as they allowed a presentational format that was much closer to the traditional Direct Instruction method of teaching. Voice-over narrations in the videodisc program allowed students to listen to the explanation of concepts as they were presented visually. The graphics were not only of much higher quality than what can be seen on computers used in today's schools, but they allowed a dynamic presentation of information that even traditional, teacher based instruction could not emulate. For example, in the videodisc program *Mastering Fractions* (Systems Impact, 1986), the relationship between the commonly used pie diagram and the number line is demonstrated through continuous animation. At one point, the pie, divided into three equal sections, unfolds onto the number line and thus directly maps the concept of thirds onto this familiar scale of measurement.

A second, but equally important consideration in choosing the videodisc was that it facilitated structured group presentations. Unlike computer assisted instruction, which is typically geared toward individual configurations, a videodisc can be operated from a distance as the teacher walks around the classroom. Moreover, as group instruction, it distinctly separates instructional roles. That is, the videodisc is the source of initial explanations, graphic demonstrations, and guided practice problems. This frees the teacher from the task of curriculum presentation and allows him or her to concentrate on monitoring the group and on individual assistance. This separation of responsibilities directly addresses the frustrations and concerns that grew out of the earlier Follow Through experience.

## Evaluation of the Videodisc

Well before a master copy of the program was pressed on a disc, it was subjected to extensive field testing. Skilled Direct Instruction teachers presented the program as it was scripted for the final disc version. This was done to assess the merit of the strategies. The program designers used videotape segments made with lower quality graphics to pilot test some of the visual presentations. Student errors and teacher feedback permitted developers to make necessary adjustments and refinements to the program. Finally, after the videodisc program became commercially available, two studies were conducted to gauge its effectiveness as an instructional medium.

In the first study, the Tennessee Valley Authority contracted with a university

within the state to evaluate *Mastering Fractions* (Hasselbring, Sherwood, & Bransford, 1986). The study, which was conducted in a large urban school district, compared the program to two other conditions: (1) a fractions curriculum used by a metropolitan school district, and (2) a highly teacher directed program that emulated the videodisc program through the use of an overhead projector. A high-achieving and an average ability class were involved in each of the two conditions.

Results of this evaluation indicated that the students receiving the *Mastering Fractions* and those in the condition that emulated the videodisc program scored significantly higher than those students who received the school district program. There were no differences on posttest scores between the two versions of the *Mastering Fractions* program. This finding suggests that the achievement gains in these groups can be attributed to the *instructional content* of the program and not to the novelty effect of the videodisc. Informal observation further indicated that even though the emulated version of the videodisc program produced comparable academic results, the demands on the teacher were considerable. In essence, the teacher-based effects were labor intensive for the teacher and required an aide in the room, one of the very reasons that led the authors to technology in the first place.

In a second, more controlled study, Kelly, Carnine, Gersten, and Grossen (1986) used the *Mastering Fractions* program with remedial and mildly handicapped secondary students in a rural high school. In this investigation, students learned fractions concepts either through a traditional basal program (*Mathematics Today* by Harcourt Brace Jovanovich) or with the *Mastering Fractions* program.

Results of the study showed that students in the basal treatment made four times as many strategy errors, such as adding unlike denominators, than did students in the videodisc treatment. The videodisc program controlled for this by providing sufficient discrimination training and practice, as well as by separating the introduction of easily confused labels. One other finding from this study led us to the research described below. As stated above, the two teachers were highly trained Direct Instruction teachers. After the posttest, the cooperating teacher, who did not participate in the study, requested to use the videodisc for the remaining lessons in the program. Informal observation over the next few weeks revealed a noticeable decline in student performance. Observers attributed much of this decline to *poor classroom management*. The importance of this variable was also noted when instruments for the subsequent study were being field tested (Woodward, 1987). It was a growing concern for the use of this technology in more typical, uncontrolled settings that led us to the following study.

## Evaluation of the Videodisc Program in a Naturalistic Setting

The purpose of this final research study was to evaluate how a group of eight teachers, with no prior background in implementing technology, would implement the *Mastering Fractions* program. Thus, even though the interactive videodisc curriculum had been rigorously field tested (Kelly,

Carnine, Gersten & Grossen, 1986) and demonstrated as effective with low achieving and special education students, questions still remained as to how teachers with a minimal amount of training would use the program.

There were two major concerns in this research project. The first was observing the extent to which the teachers used the technology and implemented the curriculum as intended. The second was an examination of how teachers felt about using this new technology and how it altered their roles as teachers. A recent review of the literature on staff development and curriculum implementation by Showers, Joyce, and Bennett (1987) concluded that "what teachers think about teaching (practices) determines what teachers do in the classroom" (p. 85). When teachers implement a new curriculum with little understanding of what they are doing or why they are doing it, they tend to discontinue its use.

## Implementation of the Study

Eight special education junior-high and high-school teachers were selected for the study based on the skill level and type of students in their math classes. Of nine teachers who were approached, eight agreed to participate. Their main interest in utilizing the videodisc curriculum was that fractions was one of the very hardest curriculum areas to teach, and that they were dissatisfied with their students' success with conventional curricula. Thus they were anxious to try something new. Participating teachers attended two one-hour inservice sessions which provided an overview of videodisc technology, an introduction to the fractions curriculum, a demonstration of how to operate the videodisc equipment, and guidelines for proper implementation of the program in the classroom.

Certain recommendations for implementation were stressed during the training: (a) spending at least 45 minutes of the class period for the lesson presentation and corresponding workbook exercises; (b) assessing student performance at the designated Checks for Student Progress (CSP) points in the videodisc lesson and providing appropriate remediation; and (c) monitoring class work to ensure that students correct their mistakes.

The inservice training was designed to parallel the amount of inservice orientation generally provided by publishers of standard print curricula. Because there was only limited time available for 'hands-on' practice with the videodisc equipment, teachers were encouraged to spend time familiarizing themselves with the equipment before presenting the first lesson to their students.

## Results of Teacher Observations

Two observations of each teacher were made during the first week of the six-week implementation. With one or two exceptions, implementation levels were quite high. All but one of the eight teachers carefully followed the procedural guidelines outlined in the inservice sessions. The most commonly observed area of difficulty in the early lessons was the remote control device; teachers occasionally misread directions on the monitor or punched an incorrect button on the remote control, both of which resulted in their accessing a wrong segment of the disc. Additional assistance was provided for four

of the eight teachers in this area.

Some teachers tended to provide students with additional explanations of the lesson content, either when students appeared to have difficulty understanding the videodisc presentation, or when conducting a workcheck. This had been discouraged in the orientation sessions because added, lengthy explanations sometimes lead to greater confusion with these kinds of students.

Subsequent observations during the remaining five weeks of the implementation revealed that teachers and students became comfortable with the structure of the program and the method of presentation within one or two weeks. As the lessons progressed, teachers incorporated their own teaching and management styles, while generally maintaining the integrity of the videodisc program implementation.

Certain procedures were more difficult for students (e.g., attending carefully to the narrator's directions and re-working problems when their answers did not match correctly-worked problems displayed on the monitor) but most were able to adapt to the procedures in classrooms where the teacher was clear and consistent in his or her behavioral expectations.

All participating teachers had been observed teaching a math class on two occasions prior to the videodisc program implementation. Preliminary findings indicate that the most notable difference in classroom variables observed before and during the implementation related to student success rate on independent worksheets. The mean percent-correct score on worksheets increased from 74.6% to 88.6% once the videodisc program began.

Levels of student on-task were almost identical before and during the videodisc program (75% and 76% respectively). However, teachers reported that students seemed much more involved in the videodisc lessons than they had been during regular instruction. This was corroborated by many students who reported that they found the videodisc lessons more interesting than conventional math instruction.

Other factors that contributed to slow progress through the curriculum were lengthy or frequent additional teacher explanations, high rates of student absenteeism, and a wide range of student abilities within an instructional group. Despite these difficulties, teachers reported that overall student mastery of the content was considerably higher than they would expect with conventional instruction. The mean score on a criterion-referenced posttest was 77%, with individual group means ranging from 64% to 90%. Observational data suggests that an implementation that closely follows the recommended procedural guidelines results in a high level of student mastery. Lower levels of mastery occurred in classrooms where certain key procedures were not implemented, for example, if the teacher failed to conduct the specified check-and-remediation procedures on a daily basis, or did not assign the specified daily workbook exercises.

After completion of the videodisc program, each teacher was observed on two more occasions to explore whether the vide-

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# The 14th Annual Eugene Direct Instruction Training and Information Conference

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## Other Presenters:

Wes Becker, Randy Sprick, Bob Dixon, Ann Arbogast, Jane Carter, Maria Collins, Gary Davis, Terry Dodds, Ann Glang, Annemieke Golly, Phyllis Haddox, Tracey Hall, Melissa Hayden, Gary Johnson, Georgia Layton, Lisa Moore, John Noell, Jerry Silbert, Marilyn Sprick, Marcy Stein, Linda Youngmayr

## Sessions

- A Teaching the Beginning Reader
- A Reading Mastery II and Fast Cycle I & II
- A Reading Mastery III-VI
- A Corrective Reading, Decoding
- A Advanced & Corrective Arithmetic
- A Teaching Academic Survival Skills
- A Teacher Training: Teaching Others to Teach DI Programs
- A Solutions to Classroom Discipline Problems
- A Diagnosis, Corrections & Firming Procedures
- A Overview of Direct Instruction Research & Theory
- A Instruction of Severely Handicapped Learners
- B Teaching the Beginning Reader
- B Reading Mastery III & IV
- B Corrective Reading, Comprehension

- B DISTAR Arithmetic I & II
- B Effective Spelling Instruction
- B Teaching Beginning Language Skills
- B Overview of Direct Instruction Programs
- B Computers and Instruction: DIAL
- B Introduction to Direct Instruction Techniques
- B Managing Severely Handicapped Learners
- B Issues in Implementation of a DI Curriculum
- C Overview of new Corrective Reading Program
- C Overview of Effective Spelling Instruction
- C Teaching Facts and Fact Systems in the Content Areas
- C Teaching Expressive Writing Skills
- C Basal Readers: Selecting, Transitioning to & Adapting
- C Computers and Instruction: The Classroom Assistant

- D Video Disk Instruction in Math
- D Direct Instruction Supplemental & Transitional Activities
- D Overview of Aspects of Supervision & Monitoring of DI Programs
- D Targeting At Risk Children in Grades K-5
- D Overview of Direct Instruction Research
- D An Integrated Approach to Direct Instruction
- E A Direct Instruction Approach to Secondary Science Instruction
- E Teach Your Child to Read in 100 Easy Lessons
- E A Direct Instruction Model for Handicapped Preschools
- E Overview of Direct Instruction Theory
- E Study Skills
- E Managing Chronic Behavior Disorders and Serious Emotional Disturbances

## Session Information

There are 40 sessions offered during the 5-day conference. Participants may attend up to 4. Sessions are either training or informational sessions. The focus of training sessions is on specific teaching behaviors. Task practice is involved in each of these sessions. The goal of informational sessions is to provide the kind of detailed information needed to implement successful techniques or understand the topic.

The sessions are scheduled in 4 time periods. Each participant will choose one "A" session, one "B" session and either one "C" session or one "D" and one "E" session.

## Session Descriptions

### "A" Session Descriptions

- 1) **Teaching the Beginning Reader** • Phyllis Haddox Regular grades K-1, non-readers in remedial grades 1-12. How to teach beginning students to read and how to teach remedial students — those who read very poorly or not at all. This session will provide training in *Reading Mastery I* and *Reading Mastery Fast-Cycle*. Participants learn the basic information and skills needed to implement the programs — placement, acceleration, scheduling, grouping, presenting prereading exercises.
- 2) **Reading Mastery II and Fast Cycle I & II** • Ann Glang Grades K-2. Specific training on rationale, implementation, placement, grouping, acceleration and other aspects of *Reading Mastery II*. Information and training on *Fast Cycle*. This program is for average or above-average students and covers the content of *Reading Mastery I & II* (360 lessons) in 170 lessons, or 1 school year. Participants will receive a copy of the *Reading II* and *Fast-Cycle Teacher's Guides*.
- 3) **Reading Mastery III, IV, V & VI** • Gary Davis Regular grades 2-6 or for students performing on grade levels 3-6. These programs present a careful sequence for teaching comprehension and decoding skills to students who have mastered the basic skills. Programs provide for meeting the full range of comprehension and decoding objectives, including management systems for monitoring student progress, and teach all component skills (vocabulary, rules, information, map skills, context analysis) needed for students to completely understand the expository and fictional selections presented in the program.
- 4) **Corrective Reading, Decoding** • Gary Johnson Regular class, low performers grades 3-8, remedial grades 3-adult. How to teach students to accurately decode, increase rate, build vocabulary and read for information in books, newspapers, and magazines. Training will be provided on the NEW 1988 edition of S.R.A.'s *Corrective Reading* Decoding programs: *Decoding A*, *Decoding B1*, *Decoding B2*, and *Decoding C*.
- 5) **Advanced and Corrective Arithmetic** • Maria Collins Regular grades 1-6, remedial 2-adult. Specific training on SRA's *Corrective Math* and *Mathematics Modules*. Programs present strategies for teaching addition, subtraction, multiplication and division. Includes tracks on facts, operations and story problems.
- 6) **Teaching Academic Survival Skills** • Marilyn Sprick Regular & remedial grades 3-9. This session will provide teachers with procedures for teaching students general academic survival skills. Participants will learn techniques for easily evaluating student ability, setting up classroom support systems, and designing grading systems. Procedures will include

teaching students to: manage time, write reports and book reports, complete homework, complete long term projects, keep track of assignments, take notes, and use rehearsal strategies for learning new information.

- 7) **Teacher Training: Teaching Others to Teach DI Programs** • Linda Youngmayr This session will focus on the elements of teaching others (teachers, aides, etc.) Direct Instruction skills in areas such as conducting training workshops, monitoring techniques and data collection. Participants attending this session should possess advanced teaching skills in one or more DI programs.
- 8) **Solutions to Classroom Discipline Problems** • Randy Sprick K-12 & Special Education. Participants will learn specific techniques for solving common types of behavior problems including absenteeism, disruptive classroom behavior, students not completing homework, tardiness, student apathy towards grades, inefficient transitions and tattling. Participants will learn a variety of practical strategies for increasing student motivation and reducing misbehavior. Some of the strategies covered include the use of rules, effective grading policies, consequences, ignoring, and procedures for helping the at-risk student.
- 9) **Diagnosis, Corrections and Firming Procedures** • Zig Engelmann For experienced Direct Instruction teachers and administrators only. This session presents information and practice on effective correction and firming procedures. The session also presents rules for efficient diagnosis of student problems and simple, direct remedies.
- 10) **Overview of Direct Instruction Research and Theory** • Wes Becker (1) A review of the major principles and analyses underlying the success of DI programs developed by Engelmann & colleagues. The overview of theory draws from Becker's book *Psychology for Teachers* (SRA, 1986). Handouts include portions of this book. (2) A review of the major research findings on the effectiveness of DI programs. Participants receive handouts covering this research that may be useful in influencing others. NOTE: This material is repeated as *Overview of Direct Instruction Theory (D)* and *Overview of Direct Instruction Research (E)*. Do not sign up for either of those sessions if you take this.
- 11) **Instructional Techniques for Severely Handicapped Learners** • Ann Arbogast Technical information on how to teach the severely retarded learner. Techniques for establishing a basis of instruction, firming responses, expanding tasks, inducing generalizations and designing appropriate programs and schedules. Techniques for dealing with students with particular learning problems such as short memory, short attention span, superstitious behavior during multiple step tasks, and restricted receptive language.



**"B" Session Descriptions**

- 12) **Teaching the Beginning Reader** • *Phyllis Haddox* Repeat of A Session. See previous description.
- 13) **Reading Mastery III, IV, V & VI** • *Gary Johnson* Regular grades 2-6 or for students performing on grade levels 3-6. These programs present a careful sequence for teaching comprehension and decoding skills to students who have mastered the basic skills. Programs provide for meeting the full range of comprehension and decoding objectives, including management systems for monitoring student progress, and teach all component skills (vocabulary, rules, information, map skills, context analysis) needed for students to completely understand the expository and fictional selections presented in the program.
- 14) **Corrective Reading, Comprehension** • *Linda Youngmayr* Regular 4-6, remedial 4-12. Developmental and remedial techniques for effective presentations with primary age students through adults. Based on Thinking Basics (Comprehension A), Comprehension Skills (Comprehension B), and Concept Applications (Comprehension C)- Direct Instruction programs that include presentations of skills such as deductions, inductions, analogies, following instructions, vocabulary building, editing, writing and logical analysis.
- 15) **DISTAR Arithmetic I & II** • *Gary Davis* Regular grades K-1, remedial students performing at grade 1. Rationale, teaching procedures and extensive role-playing practice in number identification, equality rule, the operations of addition, subtraction, algebra addition, and story problems will be presented. Also strategies for teaching multiplication story problems (picture and written), column addition and subtraction, fractions (reading, adding, reducing, and multiplying) measurement (metric and standard), and other math skills will be taught. Participants receive *Arithmetic I and II Teacher's Guides*.
- 16) **Effective Spelling Instruction** • *Bob Dixon* Regular grades 2-6, remedial 2-adult. Specific information and training on SRA's *Corrective Spelling Through Morphographs* and *Spelling Mastery Series*, a five-level basal spelling program that integrates the morphographic analysis with sound-symbol analysis and whole-word analysis. The series teaches the spelling of over 15,000 words. Session covers use of these programs in regular and special settings.
- 17) **Teaching Beginning Language Skills** • *Anemieke Golly* Regular K-1, remedial 1-6, ESL 1-12. For teachers of basic language in preschool through grade 2, and for teachers of English as a Second Language. Focus is on the language of instruction: polars, if-then, following directions, comparatives, prepositions, etc.- with an emphasis on statement production. Includes a track on how to apply concepts to new situations. Participants will receive *Language I & II Teacher's Guides*.
- 18) **Overview of Direct Instruction Programs** • *Marcy Stein* Designed to familiarize administrators and teachers with all the currently available Direct Instruction programs. Time will be spent examining the purpose and objectives of each program and the recommended implementation considerations such as: placement, group size, what types of students, grade level, transition to traditional programs, and integration of each program with other DI programs. This session is recommended for beginning DI teachers.

- 19) **Computers & Instruction: DIAL** • *Lisa Moore* In this session participants will receive hands-on training in the use of *DIAL—the Direct Instruction Authoring Language*. DIAL is an easy-to-use authoring language developed specifically for educators. With it, teachers can create sophisticated lessons in any content area. DIAL is designed for use on IBM or compatible computers.
- 20) **Introduction to Direct Instruction Techniques** • *Ann Glang* For instructional staff new to Direct Instruction programs. This introductory session will make extensive use of videotape to teach direct instruction presentation skills. In this session, participants learn to motivate students, maintain student interest, use effective signals and pacing, and correct errors effectively across all direct instruction programs. This session complements training in specific Direct Instruction programs. Recommended for newcomers to Direct Instruction.
- 21) **Managing Classroom Behavior of Severely Handicapped Learners** • *Ann Arbogast* For teachers of seriously disabled and behaviorally disordered students. Procedures for dealing with extreme behavior problems: aggression, tantrums, self-abuse, crying, and other inappropriate behavior. Specifies procedures for inducing compliance through instructional techniques and for achieving generalizations of compliant behaviors to various settings. Also introduces specific teaching principles and criteria for successful teaching of low-performing, non-compliant students.
- 22) **Issues in Implementation of Direct Instruction Programs** • *Paul McKinney* For principals, administrators, program coordinators, curriculum coordinators and those responsible for implementation of adopted programs. Participants need not possess DI teaching experience. This session will provide participants with a model for implementation of an integrated Direct Instruction curriculum. This model is a three-year system. The stages and critical steps will be detailed. Emphasis will be placed on the role of supervision and the need for on-going support. There will be extensive video taped examples of the procedures presented.

**"C" Session Descriptions**

- 23) **Overview of New Corrective Reading Program** • *Gary Johnson* Remedial grades 3-adult; regular class, lower-performers grades 3-8. This session will provide an overview and training on SRA's *Corrective Reading* programs, including the NEW 1988 edition of the Decoding programs (*Decoding A, B1, B2, and C*). The Decoding programs teach students how to decode accurately, increase rate, build vocabulary, and read for information in books, newspapers, and magazines. The Comprehension programs teach skills such as deductions, inductions, analogies, following instructions, vocabulary, writing, editing, and logical analysis.
- 24) **Overview of Effective Spelling Instruction** • *Maria Collins* Regular grades 2-6, remedial 2-adult. Specific information and training on SRA's *Corrective Spelling Through Morphographs* and *Spelling Mastery Series*, a five-level basal spelling program that integrates the morphographic analysis with sound-symbol analysis and whole-word analysis. The series teaches the spelling of over 15,000 words. Session covers use of these programs in regular and special settings.

Session descriptions continued on next page

**Conference Registration Information**

**How to Pre-Register:** Please fill out the registration form. Enclose with check or Institutional purchase order for the proper fee. Send application to the Association for Direct Instruction. Pre-registration before July 7 guarantees space in preferred sessions. Any session with less than 20 participants may be cancelled. A confirmation receipt will be sent to all pre-registered participants. *THIS FORM COVERS CONFERENCE PRE-REGISTRATION ONLY. THIS DOES NOT CONSTITUTE PRE-REGISTRATION FOR COLLEGE CREDIT OR ROOM RESERVATION.*

**Fees and Discounts:** The conference registration fee is \$160.00. Association members receive a 20% discount (\$32.00 off). Groups of 5 to 9 participants receive a 10% discount. Groups of 10-19 receive a 20% discount. For groups of 20 or more, call for a quotation. Ask for Bryan Wickman at (503) 485-1293. The member and group discounts cannot be used together. Choose the discount that will benefit you the most. The fee does not include lodging or meals with the exception of the picnic, and coffee each morning. All training materials are included in the fee. New members are eligible for the 20% discount when membership application and appropriate fees accompany registration form.

**Lodging:** The special conference rate at the Eugene Hilton is \$44.00 per day for a single. Doubles are \$52.00 (\$26.00 per person) plus tax. We will send you a reservation envelope for the Eugene Hilton. *DO NOT SEND ANY ROOM RESERVATION MONEY TO THE ASSOCIATION.*

**College Credit:** An optional 1, 2 or 3 hours of college credit through the University of Oregon Summer Session are available at an additional cost of \$32.00 per quarter unit. Persons interested in college credit should so indicate on the pre-registration form. We will send additional information on college credit along with your conference pre-registration confirmation. *DO NOT SEND ANY COLLEGE CREDIT MONEY TO THE ASSOCIATION.*

**Optional Events:** Monday there will be a picnic at Skippers Butte Park to get acquainted. A meal for you and 1 guest is included in the registration fee. Wednesday from 4:00 to 5:00 there will be a special conference presentation. Paul McKinney will address the conference and we will present the 1988 ADI Awards for Excellence in Education. Afterward, there will be an opportunity for conversation with trainers and other conference participants.

	Mon.	Tues.	Wed.	Thurs.	Fri.
AM	A	A	A	A	C/E
PM	B	B	B	C/D	Ends at 1:00pm
Evening Events	Picnic		Special Presentation		

**Early Registration**  
Sunday 6:00pm to 7:30pm

**Registration**  
Monday 8:00am to 9:00am

**Opening Session**  
Monday 9:00am to 9:30am

**Special ADI Presentation**  
Wednesday 4:00pm to 5:00pm

**Daily Sessions begin at 8:30**  
**Lunch daily from 11:30 am to 1:00pm**

**Conference Registration Form**

Please fill out the registration form completely and mail to ADI.  
Make checks payable (U.S. funds only) to **Association for Direct Instruction**.  
Because space is limited, early registration is recommended. Use an address where you will receive your mail up until the conference.

Name (as you would like it to appear on your name tag) \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Agency Affiliation \_\_\_\_\_ Position \_\_\_\_\_

I would like to register for the following (list one "A", one "B", and either one "C" or one "D" and one "E" session):

"A" \_\_\_\_\_

"B" \_\_\_\_\_

either C "C" \_\_\_\_\_

or D & E "D" \_\_\_\_\_

"E" \_\_\_\_\_

I am an Association for Direct Instruction member: Yes No

I will attend the picnic: Yes No

Have you attended the Eugene Conference previously? \_\_\_\_\_ What year(s)? \_\_\_\_\_

Please return this form with your check or District Purchase Order to:

**Association for Direct Instruction, P.O. Box 10252, Eugene, Oregon 97440**

For office use only: Date \_\_\_\_\_ Fee \_\_\_\_\_ Check \_\_\_\_\_ PO# \_\_\_\_\_ By: \_\_\_\_\_

# Research on Mastering Fractions — Continued from Page 7

odisc implementation might have affected their teaching in any way. Observations revealed a notable increase in the use of guided practice in the lesson presentation — from an average of 3 problems per lesson to 9 problems per lesson. Guided practice was used extensively in the videodisc program. Teachers also assigned independent practice that students could complete more successfully. Mean accuracy on independent worksheets increased from 75% before the videodisc implementation to 85% after its completion. While these preliminary findings are not definitive, they indicate that videodisc technology in the classroom can be an effective medium of instruction, and may also have a positive impact on conventional teaching practices.

## Results of Teacher Interviews

A semi-structured 40-to-50 minute interview was administered to all teachers after they had been using the videodisc curriculum for five to six weeks. This section will present highlights of the findings. (For a more comprehensive analysis, see Woodward and Gersten, 1988.) Table 1 presents the results of the structured items; Table 2 uses a key word method to summarize results on the more open-ended questions.

**Technical issues.** All teachers found the interactive videodisc easy to use, considering the complexity of the technology, and the fact that very few of the teachers had previous experience utilizing any type of educational technology up to this point, this is an unusual finding. The main reason for the lack

of serious problems may be the fact that the interactive videodisc curriculum was designed to be consonant with conventional classroom organization and structure. Whereas many other technological innovations call for radical restructuring of the teachers' role and the mode of instructional delivery, the videodisc curriculum merely accentuates or improves upon the existing method of teaching. Teachers still taught the entire group, and still were able to perform typical teaching functions—monitoring seatwork, checking for understanding, motivating students, providing individual tutorials to students who were experiencing diffi-

culties. In their review of the research on educational innovation, Loucks and Zacchei (1983) concluded that educational innovations are much more likely to succeed if they do not conflict radically with the basic organization of classrooms and the basic instructional strategies teachers employ.

Another major factor seemed to be that the interactive videodisc *per se* is not very difficult to use. In one teacher's words, it was only a bit more difficult to use than a home VCR. Teachers did experience some technical problems. Twenty-five percent had problems with the remote control (item 2). Some were confused with the logistics of using the

decision menus for remediation and review, both during the lesson and after quizzes. These problems seemed to reduce dramatically with time and practice.

**Utility of remediation and guided practice.** The videodisc curriculum was intentionally based on the empirically-derived model of effective classroom instruction formulated by Brophy and Good (1986). One of the cornerstones of this model is the use of guided practice and frequent assessment of student understanding of each small instructional unit. The Checks for Student Progress (CSPs) incorporated into all aspects of the videodisc curriculum make it easy for the teacher to determine when brief review segments are necessary.

All teachers but one thought the extensive use of remediation and guided practice helped students master the material. Two of the eight felt the extensive use of remediation and guided practice did slow down class progress slightly, however. This is a constant dilemma for those employing any type of instructional model based on mastery learning. Interestingly enough, only three of the eight teachers needed to frequently play back lesson segments for review and remediation purposes. The observers found that teachers were implementing the guided practice and remediation segments properly. Some classes rarely needed additional review, whereas other, lower performing classes would often need extra practice. These findings suggest that the CSP/guided practice/remediation system is a flexible one. Some

Continued on Page 11

Table 1. Teachers' Perceptions of Use of Interactive Videodisc to Teach Fractions

A. Technical Issues	Percent Yes:
1. Do you find the videodisc itself hard to use?	0%
2. Do you have problems using the remote control?	25%
3. Do you get confused making the right choices at the decision menus when they ask if 1/5 of the students missed the problems?	25%
4. How about remediation after quizzes?	38%
B. Utility of Remediation and Guided Practice in the Videodisc	
5. Do you think it helps students master the material?	88%
6. Does it end up slowing down progress?	25%
7. Do you use these frequently to playback chapters that the students need additional practice on?	38%
C. Overall Perceptions	
8. Do they participate more that they did in your regular curriculum?	88%
9. Do the students seem to be mastering the skills?	100%
10. How would you rate your experience with the program overall on a scale of 1 to 5, with 5 being the highest and 1 being the lowest?	4.5

## Conference Sessions—Continued from Page 9

25) **Teaching Facts and Fact Systems in the Content Areas** • Gary Davis Regular grades 3-5, remedial 3-12. Training on super-effective procedures for using visual-spatial displays to teach various topics in social studies and science. Based on *Your World of Facts, Levels I & II* (SRA). Training shows how to introduce fact systems and how to firm even very low-performers through the game format that is part of the program. Shows how to develop visual-spatial displays for teaching difficult-to-teach relationships.

26) **Teaching Expressive Writing Skills** • Jerry Silbert Regular grades 3-4, remedial 4-12. Overview and training in specific procedures for using *Levels I & II* of SRA's *Expressive Writing Program*. The program teaches students the most difficult first steps in expressive writing through a basic sentence writing strategy and an organization strategy that are applied to simple reporting and interpreting activities. Students learn editing, punctuation and paragraphing skills.

27) **Basal Reading Programs: Selecting, Transitioning to & Adapting** • Marilyn Sprick Addresses the concerns of administrators, special educators and regular teachers who have students who must work in a basal text. The session will cover the critical differences between major beginning reading programs and how these differences affect learning. Participants will learn "when" transition may be appropriate for "which" students. Guidelines will be given for providing supplementary work on traditional skills while students are in DISTAR reading and for use of DI techniques with basal lessons.

28) **Computers and Instruction: The Classroom Assistant** • Melissa Hayden Participants will receive training on programs designed for use with the Classroom Assistant, a computer networking system for teaching groups of students and managing instructional information. Students respond on in-

dividual keyboards and responses are scored and analyzed by a single computer. The Classroom Assistant programs are: Practice Assistant, Lecture Assistant, Grading Assistant, Testing Assistant, Keyboarding, Fractions, Word Problems, and Math Facts.

### "D" Session Descriptions

29) **Video Disc Instruction In Math** • Paul McKinney Specific training on rationale and implementation of these video disc based courses, developed by S. Engelmann; *Fractions, Decimals & Percents, Ratios*. The courses can be introduced to intermediate students. All courses are appropriate for older students who lack the skills covered in these courses.

30) **Direct Instruction Supplemental & Transitional Activities** • Tracey Hall Regular and remedial grades K-2. Specific examples of seatwork and learning center games for both reading and math as well as supplemental reading material will be shown.

31) **Overview of Aspects of Supervision and Monitoring of DI Programs** • Linda Youngmayr This session is designed for those persons who may be responsible for organizing or managing implementations of DI programs. Participants need not possess DI teaching experience. The session will focus on elements of a well supervised implementation: training, monitoring, data collection and decision making. Course will primarily be lecture style.

32) **Targeting "At Risk" Children in Grades K-5: A Direct Instruction Approach** • Ann Arbogast This session will assist teachers in identification of potentially at risk and at risk children in Grades K-5. Specifically children who are withdrawn, seek out adult attention and/or are on "the fringe" socially and academically. This session will deal with behavior management as well as academics. It will provide a plan for prevention and in-

class intervention, thereby reducing the likelihood of later referral.

33) **Overview of Direct Instruction Research** • Wes Becker A review of the major research findings on the effectiveness of DI programs. Participants receive handouts covering this research that may be useful in influencing others. NOTE: This is the same as half of the *A Session Overview of DI Research and Theory*. Do not sign up for this session if you intend on taking the A session.

34) **An Integrated Approach to Direct Instruction** • Terry Dodds For teachers of reading in grades 3-6. In this session participants will learn how to integrate listening, writing, speaking, spelling and reading skills using *Reading Mastery* or the *Corrective Reading Programs* as the basic curriculum. Materials will be provided that outline words and concepts that need to be taught for students to have an understanding of the thematic novels used as a supplement to Direct Instruction reading instruction.

### "E" Session Descriptions

35) **A DI Approach to Secondary Science Instruction** • John Noell Rationale and content of two video-disc courses developed by S. Engelmann: *Earth Science and Understanding Chemistry and Energy*. The instructional design and organization of the courses will be explained. Procedures for placement and presentation will be detailed.

36) **Teach Your Child To Read in 100 Easy Lessons** • Phyllis Haddox Training for parents, aides, or teachers who do not have Direct Instruction experience. The book, *Teach Your Child To Read in 100 Easy Lessons* (Simon & Schuster), is an adaptation of *DISTAR Reading Fast Cycle* for parent use at home. It can also be used as a low cost tutoring program. The 100 lessons are designed to teach children as young as 4 years old the skills necessary to read on a second grade level.

37) **Overview of Direct Instruction Theory**

• Wes Becker A review of the major principles and analyses underlying the success of DI programs developed by Engelmann & colleagues. The overview of theory draws from Becker's book *Psychology for Teachers* (SRA, 1986). Handouts include portions of this book. NOTE: This is the same as half of the *A Session Overview of DI Research and Theory*. Do not sign up for this session if you intend on taking the A session.

38) **Study Skills** • Mary Gleason Regular Grades 3-6, Learning Handicapped Grades 3-9. Participants will watch demonstrations of lessons, will practice teaching lessons and will receive handouts that illustrate the strategies learned in the session. The session will present the organizational skills and learning strategies that are part of *Skills for School Success*, published by Curriculum Associates.

39) **Managing Chronic Behavior Disorders and Serious Emotional Disturbances** • Jane Carter Rationale for using the DI approach with students in regular classrooms as well as those in self-contained, SED classrooms. Specific procedures for diagnosing the behavior of students with emotional problems will be presented. Techniques for management of escalated and out of control behavior, non-compliance, impulsiveness, passive resistance, avoidance and withdrawn behavior will be presented and practiced. Participants will receive the manual *Managing Emotional Behavior* which summarizes rules and procedures for working with students who have emotional problems.

40) **A Direct Instruction Model for Handicapped Preschools** • Georgia Layton A classroom-based model for teaching mildly and moderately handicapped children (as used in the ADI Early Education Preschool) will be described. Curriculum objectives and programs to teach these objectives will be detailed. Strategies to enhance efficiency will be discussed.

# Research on Mastering Fractions — Continued from Page 10

classes will rarely need to take advantage of the procedures; yet it is always available if students are experiencing problems with a particular concept or skill.

**Active participation/ interactive teaching.** All but one of the teachers felt that students participated more in the lesson with the videodisc than with conventional teaching. Again, the effect was clearly intentional. Research on effective mathematics instruction consistently shows high correlations between student response rate during the lesson and growth in achievement. The videodisc curriculum was set up to require students to respond frequently during the lesson. The teachers felt the videodisc system succeeded in this goal.

**Perceptions of the overall utility of the videodisc curriculum.** All eight special education teachers felt the students were mastering the skills. As mentioned earlier in this chapter, these teachers had previously found fractions one of the most difficult topics in mathematics to teach, and were dissatisfied with most existing curricula. In years past, many students had failed to learn several of the major topics covered. During the open-ended segment of the interviews, teachers indicated the specific strategies that they found to be successful—the use of a number line, the instructional strategy for finding least common denominator, the teaching of improper fractions. Finally, teachers were asked to provide a global rating of the videodisc curriculum on a 1 to 5 scale. The mean score was 4.5, an extremely high assessment for an innovative practice.

## Results on Open Ended Items

Table 2 presents a brief summary of how teachers responded to the open-ended questions. As might be expected, they unanimously found the graphics and special effects to be the best features of the curriculum. They all mentioned how the computer graphics could visually demonstrate relationships and concepts so much more elegantly, with so many more examples, and so much more quickly than they could with a chalkboard or colored paper and scissors. They also expressed that the students seemed much more

interested and attentive to the bright colors, and visual excitement of the graphic displays.

However, half the teachers also were sensitive to the innovations in the curriculum design. They talked about the orchestration of skills across many lessons, the range of activities incorporated into each lesson. They indicated how this type of subtle orchestration would be extremely difficult, if not impossible, without the aid of technology. Finally, two of the eight teachers mentioned the provision for remediation as one of the best features of the curriculum.

Two factors emerged as weak features of the program to some teachers (item 2). One of the teachers felt the curriculum was too juvenile for remedial high school students. Three of the eight felt there was too much paperwork involved in the rather complex mastery learning system that involved daily checks of independent seatwork, as well as group checks of daily quiz performance.

We next asked teachers to indicate how teaching with the interactive videodisc curriculum was different from their conventional curriculum. The majority of the teachers pinpointed the key principle in the design of the curriculum, that things were broken into much smaller steps than is typical. The teachers cited the advantage of such an approach for teaching low-performing students.

Several of the teachers also felt that with this curriculum, they were able to monitor student work more frequently and more precisely than before. They talked about how their role had shifted from an individual who primarily explains and demonstrates new concepts to one who primarily makes sure students understand the new material, and helps those students with problems. All eight teachers thought the interactive videodisc had great potential for future use in both special education and regular classroom instruction, particularly in the areas of mathematics and science.

Since the videodisc curriculum is so much more structured than conventional curriculum, and the role of the teacher much more

precisely defined and delimited, we concluded by exploring teachers' reactions to these constraints. Seven of the eight teachers liked the way everything was structured and laid out for them. They all felt that as a result of the videodisc, they did "less talking" and explaining. Seven of the eight indicated how the videodisc freed them up to perform other teaching functions with more precision. They were now able to monitor carefully how all students were doing, provide praise and encouragement to students for effort, or provide brief, focused tutorial sessions. The structure of the videodisc allowed them to teach in a more interactive fashion, to more closely follow the model of teaching that research has found to be effective, particularly for low-achieving students (Brophy & Good, 1986).

When some individuals first see the videodisc, they indicate that teachers won't like it; that, essentially it replaces the teacher. So we were curious to see how these teachers felt after six weeks of implementation. We asked whether they felt "replaced" by the videodisc. Three quarters gave a resounding "no." They saw their role as providers of feedback and support as essential. They also saw the importance of what several called "the human factor," the need for an adult to make instructional decisions.

## Summary and Conclusions

A repeated theme in these different evaluations of the videodisc *Mastering Fractions* curriculum is that technology can solve specific instructional problems. This is most obvious in the labor intensive part of active instruction, where teachers must present information, check for understanding, provide corrective feedback for errors, and monitor group and individual performance on a continual basis. Technology of this kind can help separate the roles of instruction, allocating to the videodisc dynamic, well-paced presentations and freeing the teacher to closely monitor student performance. Based on the perceptions of all of the teachers in the last study, this separation of roles is neither demeaning nor threatening. On the contrary, the videodisc program made classroom instruction more effective.

A second observation is that technology need not always call for a radical shift in classroom practices. Unlike a microcomputer lab, where individualized instruction is almost a necessary by-product of the setting, videodisc instruction melded well with group instruction in the classroom. Again,

results from the naturalistic study indicated that the program made teaching easier and more effective; an observation which is confirmed by the high levels of implementation, its extremely positive rating by the teachers at the end, and the growth in student achievement.

To be sure, the success of the *Mastering Fractions* program is not the result of the inherent features of the technology. Rather, it reflects a thoughtful integration of instructional design and effective teaching practices with a particular technological medium. Well designed videodisc instruction, then, can offer a focal point for merging research based practices of curriculum design and classroom instruction.

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Table 2. Percent of Teachers Who Used Key Words to Answer Open Ended Questions

1. What are the best features of the program?	
A. Graphics as a means of demonstrating concepts	100%
B. Special effects	88%
C. Design of the curriculum/orchestration of skills and activities	50%
D. Remediation	25%
2. What are its weakest features?	
A. Too juvenile or oriented to-young students	13%
B. Too much paperwork	37%
3. What are the biggest ways that it is different from how you taught fractions before?	
A. Things are broken into smaller steps	63%
B. More monitoring of student work than before	38%
4. Have you seen any changes in the students (open ended)?	
Improved work habits	88%
5. What kind of future do you think something like the videodisc has in the schools (regular or special ed)?	
Great	100%
6. Do you like the way everything is laid out for you, the way everything is structured?	
Yes	88%
7. Some people have reacted to this kind of use of the videodisc by saying that it will "replace" the teacher. What do you think about this kind of reactions?	
A. It won't replace the teacher	75%
B. You always need a human factor, someone to make decisions	38%

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**TASK 3 Before, After**

These pictures tell a story about what a girl did.

- Point to picture 1. First the girl picked the apples.
- What did she do after she picked the apples? Touch picture 2. Pulled the wagon.
- What did she do after she pulled the wagon? Touch picture 3. Lined the wagon.
- What did she do after she lined the wagon? Touch picture 4. Covered the apples.

Let's do it again. This time I'm not going to point to the pictures.

- What did the girl do first? Signal. Picked the apples.
- What did she do after she picked the apples? Signal. Pulled the wagon.
- What did she do after she lined the wagon? Signal. Lined the wagon.
- What did she do after she covered the apples? Signal. Covered the apples.

Repeat a through m until all children's responses are firm.

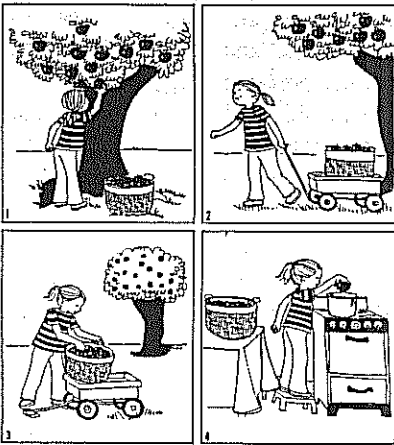
- Point to picture 4.
- What is the girl doing in this picture? Touch. Cleaning the wagon.

Now think hard. I'm not going to point to the pictures.

- What did she do before she covered the apples? Signal. Lined the wagon.
- What did she do before she lined the wagon? Signal. Pulled the wagon.
- What did she do before she pulled the wagon? Signal. Picked the apples.

Repeat a through m until all children's responses are firm.

Individual Test  
Repeat a through m, calling on different children for each step.



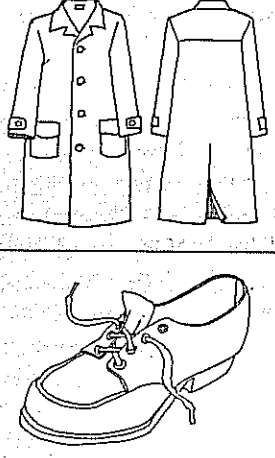
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**TASK 10 Part-Whole**

Let's see if you remember the parts of these objects.

- Get ready to tell me the parts of a coat. Say the whole thing. Point to the front. Pause. Touch. A coat has a front. Point to the buttons. Pause. Touch. A coat has buttons. Point to the collar. Pause. Touch. A coat has a collar. Point to the back. Pause. Touch. A coat has a back. Point to the pocket. Pause. Touch. A coat has pockets. Point to the sleeves. Pause. Touch. A coat has sleeves. Repeat a until all children's responses are firm.
- Circle the coat. And what do you call the whole object? Touch. A coat.
- And what do we usually do with a coat? Touch. Please reasonable responses.

- Get ready to tell me the parts of a shoe. Say the whole thing. Point to the heel. Pause. Touch. A shoe has a heel. Point to the sole. Pause. Touch. A shoe has a sole. Point to the tongue. Pause. Touch. A shoe has a tongue. Point to the laces. Pause. Touch. A shoe has laces. Point to the top. Pause. Touch. A shoe has a top. Repeat a until all children's responses are firm.
- Circle the shoe. And what do you call the whole object? Touch. A shoe.
- And what do we usually do with a shoe? Touch. Please reasonable responses.



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**TASK 4 Locations**

Today we're going to learn about a farm.

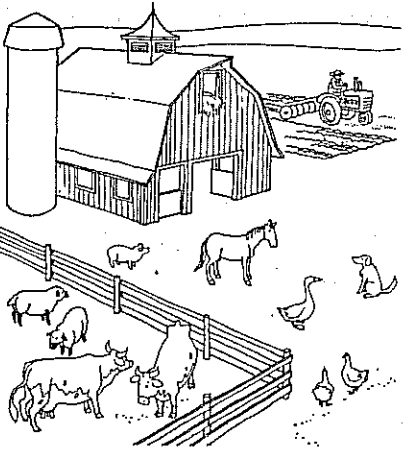
- What do we call a place where food is grown? Farm. A farm.
- Here's a picture of a farm. I'll name some of the things you see on a farm. Watch. Point to each item in turn.
- This is a cow. What is this? Touch. A cow. Cows live on farms and give us milk.
- These are sheep. What are these? Touch. Sheep. Sheep give us wool.
- This is a barn. What is this? Touch. A barn. A barn is where farm animals live.
- This is a tractor. What is this? Touch. A tractor. The farmer is plowing the land with the tractor.
- These are chickens. What are these? Touch. Chickens. Chickens give us eggs.

Let's see if you remember the names of these things.

- Point to the cow. What is this? Touch. A cow.
- Point to the sheep. What are these? Touch. Sheep.
- Point to the barn. What is this? Touch. A barn.
- Point to the tractor. What is this? Touch. A tractor.
- Point to the chickens. What are these? Touch. Chickens.

Repeat g through m until all children can identify all of the items.

- Visit the farm you see in the picture. Call on different children.
- Circle the entire picture. What do we call the place you see in this picture? Touch. A farm.
- Can you think of something else you would see on a farm? Accept reasonable responses.



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# A Field Trial of Mastering Fractions Videodisc Program

by Steve Carter and Julie Rice  
Centennial Elementary School and Steve Ragan  
Lewis Clark State College

The use of media of varying kinds, including modern technologies, in today's classroom has been validated as effective and efficient when used appropriately to meet specific objectives. A wide variety of technologies are available for classroom use. Major obstacles to the consistent nationwide usage of specific technologies occur because of such factors as reliance on *tradition*, over-reliance on the *text-as-the-curriculum*, initial *capital outlay* for purchase of new technology, and *teacher unfamiliarity and/or fear* of a new technology. Adoption of one of the newest technologies, the laser videodisc is likely to be slowed by many of the above limitations.

Traditionally, the teacher is the focus of attention in instruction, and is not just a person who closely monitors and corrects students' responses while a technology presents the information. Also, most teachers rely heavily upon and follow closely whatever textbook has been chosen by the district for use in the classroom. Both the traditional role and the reliance on textbooks predominate in education regardless of the superiority of alternatives in terms of student learning.

Another factor in the resistance to newer technologies is cost. A videodisc player costs from \$400 to \$700 and programs of a sophisticated instructional nature often cost from several hundred to several thousand dollars per disc. At first glance this seems to be a huge investment for a rather small amount of "material." Of course, the focus should not be on how much material or media is bought per dollar, but how much learning occurs per student per dollar spent.

In this article, the authors relate their experience in forgetting the obstacles and testing out a new technology.

## The Setting

The project undertaken by the writers of this article, involved the use of one videodisc program *Mastering Fractions*, to teach a regular mainstream class of fifth grade students. The project began in February, 1987, as a cooperative venture between Centennial

Elementary School, Lewis Clark State College, and The Columbia Direct Instruction Association, Inc.

The class involved in the project was a typical fifth grade class including a heterogeneous mix of students who were very bright, average in skills, and low in skill levels. One of the students in the class could be described as moderately learning handicapped. The classroom teacher had not been, and was not, formally trained in the use of the media beyond simply watching a demonstration of the use of the hand-held remote control unit. The resource room teacher was involved to the extent that she monitored the progress made by the mainstreamed handicapped child and offered consultation to the classroom teacher as she normally would have. The College of Education faculty member offered an initial demonstration of the media and assisted in the analysis of the data collected.

## The Program

The *Mastering Fractions* program consists of three discs that take students through all of the basic concepts involved in mastering fractions from developing skills in identifying fractions, through developing skills in adding, subtracting, multiplying, and dividing fractions; and working with a limited number of "story problems" involving fractions. The 35-lesson program is designed to be taught in 35 to 45 minute lessons.

As displayed in Figure 1, the *Mastering Fractions* program has been previously validated and has demonstrated its efficacy. The data in Figure 1 show that the students in that study approached or exceeded the mastery level of 80% on all test lessons. The present study hoped to replicate those data with a new group of students.

Lessons may be presented on a daily basis or they may be presented only two or three days per week. Main lessons, quizzes, review lessons and tests are provided. Guidance is provided within the disc-based program regarding selection of review lessons, depending upon the performance of the students in the class.

In this particular instance, the classroom teacher followed the program closely and took data as quizzes and tests were appropriate for the students skills development. The classroom teacher used the manual provided with the media as a guide for moving through

the lessons. No special provisions were made for bright, average, slow or handicapped students, except that students not mastering a lesson could review it, on their own time. The program was completed by the students in approximately three months.

## The Results

The results of the project showed mastery of *all* of the skills by approximately 90% of the students. The three students who did not master (at the 80% level) all of the skills were either absent so much of the time that practical review was impossible within the project time period, or handicapped. In the case of the handicapped student, significant progress was made in mastering approximately 75% of the skills presented. The upper half of the class consistently mastered the skills quickly and moved through the lessons on, basically, a first trial basis. Students in the lower half of the class used review time during their free time to master lessons.

## Limitations

As with any study, this project has its limitations. There was no attempt to form a control group. Because of this, generalization of the results are limited. It is correct that the gains were made. It is correct that the handicapped child was treated just like other children and not only performed above expectations, but was not a detriment to the performance of the class.

## Discussion

As the results indicate, the level of mastery achieved by the students in this class is far above the average achievement levels attained through textbook coverage of the same material. It is not, for example, unusual for 50% of a class to be unable to perform at mastery levels in fractions when they are in junior high school to say nothing of the fifth grade.

Another remarkable result of the project is the inclusion of a moderately learning handicapped student in the program taught to the entire class. Considering the level of the handicap involved and the fact that the student did not hold back the rest of the class, as is so often feared by regular classroom teachers, the progress made by the student was excellent. The successful use of the media by a regular classroom teacher with no training in the use of the program demonstrates the efficacy of the program as a stand-alone

program requiring little introduction and no formal training.

The cost-effectiveness of the media should be apparent to anyone. There were no training costs. The material and equipment together cost approximately \$2,500. Thus, the project cost less than \$100 per child to teach a very difficult skill often not mastered even by adults. As more than one classroom in a building and more than one instructional program are purchased for use in the building the cost effectiveness becomes obvious. With six hours in an instructional day and 25 students using the media each hour the program costs per student for one year *only* become less than one-third that of the average textbook. As the cost is amortized over three-to-five years the cost per student really becomes pennies rather than dollars.

## Conclusion

The use of videodisc instruction (*Mastering Fractions*) can be a successful experience for normal fifth grade students where once it was frustrating. It can represent a way to mainstream very difficult students successfully into a classroom for part of a "real content area" activity, rather than the traditional free-time, play time, art or P.E. mainstreaming that has been the rule in the past. And, it can represent a cost-effective alternative to less effective, but initially less expensive, materials.

*Mastering Fractions* in this setting was extremely successful. The media facilitated skill development for all students, increased mastery to 90% of the students, and proved useful in the effort to mainstream significantly handicapped students.

## Recommendations

In light of the limitations of this report, the following recommendations seem in order:

1. If it has not by the time this article is published, *Mastering Fractions* should be validated in a well-controlled experimental research study<sup>1</sup>. Such a study would not only add validity to the present and past studies, but, if successful, would add generalizability to the effectiveness of the program.

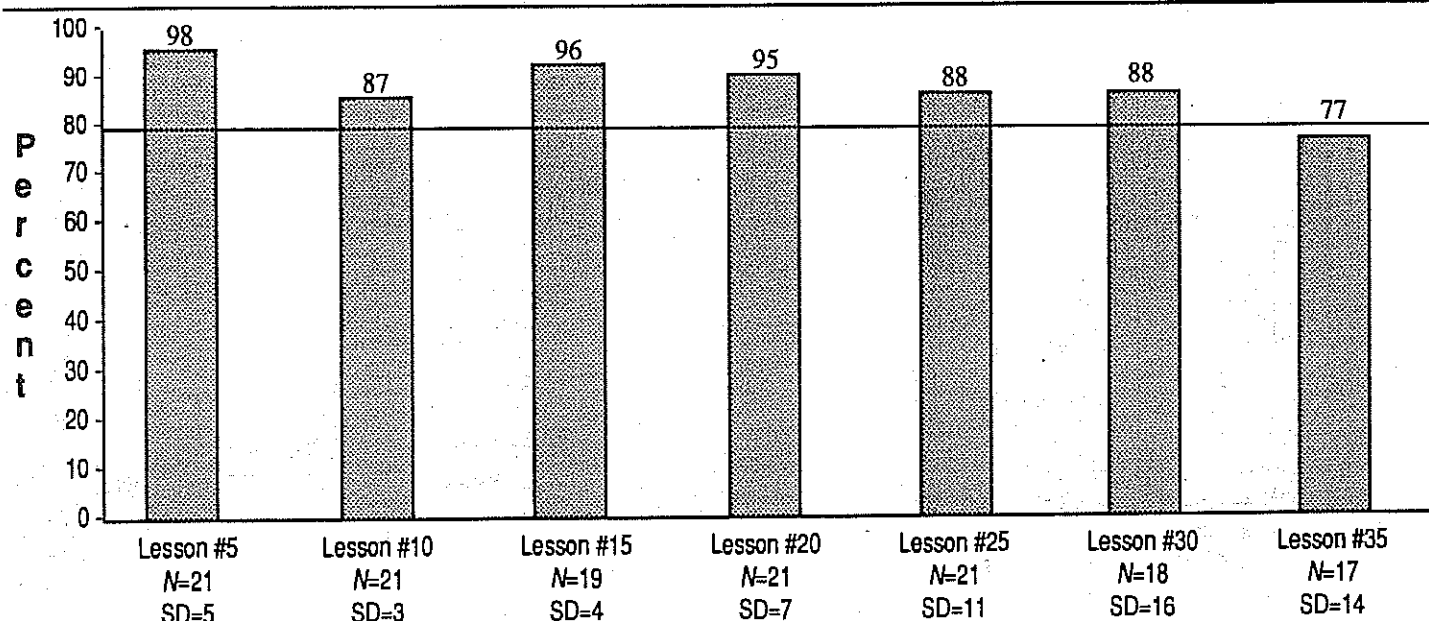
2. Data should be gathered on the effectiveness of the program at other levels in public schools<sup>2</sup>. While it is correct that fractions, as a curriculum area, is appropriate for fifth and sixth grade students, there are certainly older students who could potentially profit from review and/or instruction in the program. Also, bright younger children might be accelerated by using this program. (A descriptive study of the kind reported in this article, with Chapter 1 senior high students, is currently under way by Steve Ragan and Ken Jacks at Clarkston High School, Clarkston, WA.) Data from this study should be available by May, 1988.

Thus, while the material appears to be extremely effective in appropriate settings it should be further evaluated for appropriateness to other settings and populations. The skill involved is so important as to make an effective instructional media or material a high priority item indeed. Considering the initial outlay for the material, effectiveness data must be made abundantly available to potential consumers.

<sup>1</sup>See Kelly, Carnine, Gersten, & Grossen (1986). Teaching fractions to learning handicapped and remedial students. *ADI News*, 5, (3), pp. 1, 8-10, 19.

<sup>2</sup>See Kelly, et al., in this issue.

Figure 1. Mastering Fractions Validation Mean Score by Lesson



Systems Impact, Inc. Unpublished Data Sheet. Washington, D.C., 1985

# Amount of Training in DI and Outcomes with Secondary Handicapped Students

by Calvin V. Edlund\*  
Robert R. Ogle

San Juan Unified School District

\*This project was funded by BEH Grant #G007804994, Secondary Handicapped Children's Model Project

*Editor's Note:* This study was carried out 8 years ago and was never published. It tests the effects of differing amounts of training in DI teaching methods on gains made in Reading (decoding) and Spelling on the WRAT by Secondary Handicapped students. The statistical analyses used the students ( $N = 48$ ) as the basis for assessing error terms. It would have been more appropriate to use the number of teachers ( $N = 6$ ). However, the outcomes (especially for Reading) show differences related to training which are suggestive. There is a need for more extensive studies of the effects of teacher training on performance with DI materials. If anyone is planning such studies, I would be glad to critique them for you beforehand.

Direct Instruction has become an increasingly applied technology in the classroom (Abt 1976, 1977; Bracey, Maggs, Morath, 1975; Engelmann, 1968; Maggs and Morath, 1976; and Rosenshine, 1976). This technology is based upon certain principles which acknowledge that behavior (including academic skill) is learned, and if learned can be taught. As such, the emphases are upon knowing and applying the principles regarding how behavior is learned and a thorough acquaintance by the teacher with the skill to be learned, in all its sequences, so that the skill can be properly presented to the learner. This, then, would provide a strategy across ability levels or disabilities which would have the effect of simplifying and unifying education.

For a teacher to become proficient in Direct Instruction, intensive training would seem to be required. Direct Instruction includes several components such as: (a) program or skill sequences, (b) specified teaching procedures, (c) motivational strategies, and (d) procedures for and evaluation of student progress. The question raised by this paper is what length or intensity of training is needed to produce an effective DI teacher.

This study sought to observe the effects of various degrees of teacher training intensity in Direct Instruction procedures on the academic skill growth of secondary learning handicapped students.

## Method

### Subjects

The six teachers who participated in this study were credentialed for both regular and special education instruction. They had an average of 6.5 years teaching experience in special education classes as head teachers with secondary learning handicapped students in the San Juan Unified School District.

The students participating in the project were 48 in number. They were identified by psychologists as having average intelligence (I.Q. between 90 and 110) with one or more learning disabilities and functioning below expectancy in one or more academic skill areas (at least 1.5 standard deviations below, using the Wechsler Intelligence Scale for Children—Revised and the Wide Range Achievement Test). Their ages ranged from 12 to 19 years.

Project trainers were credentialed teachers (regular and special education) who had

received 6 weeks training in Direct Instruction and had successfully taught Direct Instruction in their secondary special education class for two years or more prior to the project.

Two teachers were given six weeks training in Direct Instruction, two more were given one week of training in Direct Instruction, and two more (the control group) received no training in Direct Instruction. The six teachers were randomly assigned to one of the three groups.

The training included:

1. Information about the nature of Direct Instruction.
2. Familiarization with the instructional materials to be used in the project (*Learning to Remember, Spelling for Work, Corrective Reading, and Morphographic Spelling*).
3. Modeling of Direct Instruction presentation by trainers.
4. Guided practice for the trainees.
5. In-classroom follow-up supervision.

The target behaviors taught the trainee teachers were:

1. Precise signalling of student oral responses including arm, hand, and voice signals.
2. Correction procedures, including reference to a model, to the specific rule, and discrimination correction practice.
3. Securing unison oral responses by all students.
4. Determining a reinforcement standard in terms of student quality/quantity ratio.
5. Reinforcing students in reading and spelling (including oral and written responses) in terms of maximum quality/quantity ratio performance.

The Direct Instruction procedures the teachers learned were in script form. The teachers were trained to accurately read and follow the directions in the scripts. This format was chosen so as to keep the risk of inaccuracy of the independent variable as low as possible.

The six-week training program placed the trainee teacher for three weeks in a model classroom (which had been using Direct Instruction for several months) and then returned the trainee to his or her own classroom for the remaining three weeks with the trainer teacher. During the three weeks, the trainee teacher was absent from his/her classroom, a substitute teacher, trained in Direct Instruction, covered the class.

The daily guided practice included observation of trainee teacher's performance in reading and spelling by trainer teacher and periodic review of the trainee's performance. The trainee's performance was video recorded. Both trainee and trainer would view the recording with the trainer verbally reinforcing correct performances. Incorrect performances were dealt with by trainer describing the desired correct performance and noting this on a paper for the trainee to review.

The one-week training program followed the same outline as the six-week program except there was much less opportunity for supervised practice. The daily procedure included an introduction to what was to be presented that day with some background information and description. This was followed by a demonstration. Supervised prac-

tice was provided for each participant following each demonstration. Following the initial training in Direct Instruction, the trainees returned to their classrooms to implement the training. These teachers were visited twice monthly by project trainers to observe regarding the continued use of Direct Instruction by the teachers and particularly the scripted instructional procedure. While the teachers were receiving Direct Instruction training, their classes were covered for the one-week period by a teacher who had been trained in Direct Instruction.

The control groups were also visited twice monthly to answer any questions they might have regarding their students. The control group teachers had the Direct Instruction manuals which they studied on their own in their preparation periods without formal instruction.

The dependent variable was the academic skill gains in reading and spelling the student made after having been exposed to Direct Instruction for a school year. Near the end of each school year all students in the district were given the Wide Range Achievement Test (WRAT) by credentialed psychologists or trained credentialed teachers. The student spring-to-spring gains on the WRAT Reading and Spelling were used in the analysis. A one-way analysis of variance was used to evaluate the similarity of the pretest and posttest dates of all three groups of students, the time between pre- and posttesting, the pretest scores to determine similarity of groups, and the statistical reliability of the difference of the student gain scores in Reading and Spelling. Standard scores in Reading and Spelling were compared for all three groups.

## Results

Since the district did not require all tests to be given at the same time, there was variation in testing dates. Average pretest dates were in March, but the means for each group were very close to each other. Average posttest dates were in February and again, they differed little across groups. The time between testings did not differ for the groups.

Pretest means by groups were examined (see Table 1). Standard scores on the WRAT have a mean of 100 and a standard deviation of 15 (like IQ scores) and do not increase from year-to-year (on the average). The pretest means show that the students were about 1.5 standard deviations behind the mean in Reading and 2.0 in Spelling. (Assuming the mean age of the group is between 14 and 15, these standard score means imply average grade-equivalent scores of 5.0

grades in Reading and 3.6 in Spelling.)

## Gains

The gains by group are summarized in Tables 2, 3, and 4. Table 2 shows the mean standard score gains in Reading and Spelling. Tables 3 and 4 show the distributions of gain (or loss) scores. Translated into grade equivalents, the 6-week training group gained a year (from 5.0 to 6.0) on Reading. The other two groups showed little gain. In Spelling, the 6-week and the 1-week groups gained about the same, but both gained more than the control group.

These results suggest a training effect and perhaps imply that it is easier to train for *Morphographic Spelling* than it is for *Corrective Reading*. However, if this were so, the gains should be greater in Spelling.

## Discussion

This project did not set out to study the effectiveness of Direct Instruction. The authors felt this has been demonstrated in several other studies referred to in the opening paragraphs. This project sought to study ways of effectively training teachers in the skills of Direct Instruction which would maximize its effectiveness in terms of student academic skill growth. The training emphasized understanding of Direct Instruction, use of scripted classroom procedures for the teachers, extended time to observe and practice Direct Instruction under supervision, and, immediately following the training, by implementing the program in the classroom for the school year. The use of student academic growth as the measurement of teacher training effectiveness was felt to be the most realistic measure of effectiveness.

The importance of this study is in the direction of extending our knowledge regarding the teacher training process. The project sought to simplify as much as possible the teacher behavior to be learned by teachers for technical evaluation purposes, but also to expedite the training. The scripted format seemed most suited. It is interesting that as precise as the scripted format was, the more intensive or extended training was overall more effective. The suggestion here seems to be—precise teaching behaviors require time to acquire for effective performance.

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Table 1. Standard Score pretest means by Group in Reading and Spelling.

Group	N	Reading		Spelling	
		Mean	S.D.	Mean	S.D.
Control	10	78.00	9.36	70.80	4.57
1-week Training	19	76.84	9.17	70.22	7.08
6-weeks Training	19	77.11	8.84	72.95	5.55

Table 2. Mean Gains by Group in Reading and Spelling.

Group	N	Reading		Spelling	
		Mean	S.D.	Mean	S.D.
Control	10	-.50	6.38	-1.10	3.14
1-week Training	19	.53	5.75	3.17	4.30
6-weeks Training	19	8.37	7.14	3.53	3.44

Table 3. Distribution of Gains by Group on WRAT Reading Standard Scores.

	All Data	Control Group	1-week Group	6-week Group	
Gain in Reading Standard Scores	1			1	
	1			1	
	4			4	
	10	2	4	4	gain
	15	3	3	9	
	10	2	3		no gain
	4	1	3		loss
	1	1			
	1	1			
	1		1		

Table 4. Distribution of Gains by Group on WRAT Spelling Standard Scores.

	All Data	Control Group	1-week Group	6-week Group	
Gain in Spelling Standard Scores	1		1		
	3		2	1	
	1			1	
	2		1	1	
	3			3	
	12	1	4	7	gain
	9	2	3	3	
	7	1	5	1	no gain
	3	1	2		loss
	4	2		2	

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## Send Your Nominations for 1988 ADI Excellence Awards

Nominations are now open for the 1988 ADI Awards for Excellence in Education. Each year, ADI recognizes several individuals who have distinguished themselves by their commitment to excellence for all students through the technology of Direct Instruction. Since the awards were inaugurated in 1982, they have been given in three categories — teaching, (elementary and/or secondary), administration/supervision, and teacher training/research. We invite nomination in these categories again for the 1988 awards. In addition, we would like to encourage you to nominate people who, through Direct Instruction, have shown exemplary commitment to the education of all children — regardless of their job title or position.

It seems that people who advocate for students through Direct Instruction play different roles in different school systems. Often they are teachers, supervisors, or trainers, as our present categories indicate. But they can also be school psychologists,

counselors, teacher aides, parents, school board members, etc. No role has the corner on the student advocacy market. Thus, we plan to accept nominations in an "open" category (in addition to our previous categories) in the 1988 ADI awards competition. If you know of someone who has been a long-time ardent supporter of students through Direct Instruction, please consider nominating them for an ADI award, regardless of their position or title.

Nominations should be made through a letter submitted to the ADI Board of Directors by June 15, 1988. The letter may be signed by more than one person, and you may enclose any supporting documentation which you deem relevant to your nomination. Send materials to:

Association for Direct Instruction  
1988 Awards Committee  
P.O. Box 10252  
Eugene, OR 97440

### The Association for Direct Instruction Presents— The Second Midwest Direct Instruction Institute June 27-29, 1988 • Woodfield Hilton & Towers Arlington Heights, Illinois

#### Institute Sessions and Presenters:

##### "A" Sessions

DISTAR Reading Mastery I & II • Maria Collins  
Reading Mastery III-VI • Jean Osborn  
Teaching the Corrective Reader • Jane Fineberg  
Issues in Implementation & Evaluation of Instructional Programs • Paul McKinney  
Managing the Full Range of Behavior Problems • Geoff Colvin

##### "B" Sessions

Teaching Expressive Writing • Jane Fineberg  
Effective Spelling Instruction • Maria Collins  
DISTAR Language I & II • Jean Osborn  
DISTAR Arithmetic I & II • Paul McKinney  
Managing the Full Range of Behavior Problems (continued) • Geoff Colvin

#### Institute Registration Information

**Where-When:** To be held June 27-29, 1988, at the Woodfield Hilton Hotel & Towers, 3400 West Euclid Ave., Arlington Heights, Illinois, 60006.

**How to Pre-Register:** Use the form provided or write to ADI for a full brochure with session descriptions and Institute Preregistration form.

**Training Fees and Discounts:** The fee for the 3-day Institute is \$145.00. Association members receive a 20% discount (\$29.00). Groups of 5 to 9 participants receive a 10% discount. Groups of 10-19 receive a 20% discount. For groups of 20 or more, call for a quotation. Ask for Bryan Wickman at (503) 485-1293.

**Lodging:** The Association has negotiated a very special \$69.00 single, \$79.00 double room rate for the week of the Institute with the Woodfield Hilton Hotel. We encourage out-of-town participants to take advantage of the convenience of the free, secure parking, excellent location and quality service that the Hilton will provide. If you would like to make reservations by phone you may contact the Woodfield Hilton at (312) 394-2000. You need to tell them you are with the ADI Institute to receive the reduced rate. Early reservations are recommended.

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