Impact of Professional Development for Teachers on Children’s Early Literacy Development

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This paper provides background information on the Interactive Strategies Approach to early literacy instruction and intervention (ISA, Scanlon, Anderson, & Sweeney, 2010; Vellutino & Scanlon, 2002) and presents evidence suggesting that first grade classroom teachers who participated in professional development activities related to the approach were more successful in advancing the literacy skills of their students who were identified as being at risk of experiencing reading difficulties. The connection between this paper and the two others that are part of this symposium is that the content of the ISA professional development program served as the basis for the development of instructional resources for pre-service teacher education courses that focus on literacy development in the early primary grades.

*What is the ISA?*

“The ISA is an approach to early literacy instruction, not a program. It is not tied to particular instructional materials, nor does it provide highly scripted instructional interactions. Rather, the ISA offers a way to conceptualize early literacy development and to support children as they learn to read and write. We view teachers as professionals who use their knowledge of their students’ skills and abilities in combination with knowledge of their curriculum and the process of literacy development more generally to plan and deliver effective literacy instruction.” (Scanlon et al., 2010, p. 4).

In teaching teachers about the ISA, our primary goal is to “help teachers more thoroughly understand early literacy development and to effectively respond to, plan for, and teach the children who find reading challenging” (ibid p. 4). To meet this goal, across multiple iterations of the ISA, we drew on the growing body of research related to early literacy development, literacy learning difficulties, and effective practices, and our experience in working with struggling readers and observing and collaborating with kindergarten and first grade teachers.
who were working with struggling learners. Our professional development program evolved over a period of more than 15 years with changes reflecting the growing body of research on early literacy development and interventions for struggling learners, our own research on interventions for struggling readers, and the changing populations with whom we worked.

The name of the approach (the Interactive Strategies Approach) conveys the importance we have always placed on helping children become strategic readers and writers. “The goal of instruction should be to teach foundational skills and strategies that children will learn to use independently, flexibly, and interactively while reading and writing. Through this active and thoughtful engagement in reading, children will grow as readers.” (ibid pp. 4-5).

In this paper we describe the version of the ISA that was in use when the research reported in this paper was conducted. It is also the version that served as the point of departure for the research done with teacher educators and their students which will be discussed in two other papers included in this symposium.

The ISA is theoretically grounded in several guiding assumptions derived from reading research (Ehri, 1991; Frith, 1985; Henderson, 1990; McClelland & Rumelhart, 1981; Plaut, McClelland, Seidenberg, & Patterson, 1996; Seidenberg & McClelland, 1989), which, in brief, dictate that, to learn to read printed words in an alphabetic writing system, children must: acquire knowledge of and have ready access to all of the featural information embodied in words (visual, orthographic, phonological, semantic, and syntactic); learn about print concepts and conventions that uniquely define the system; learn about the structural properties of its spoken and written counterparts; learn to make functional use of the alphabetic code; acquire alternative and complementary (code- and meaning-based) strategies for identifying unfamiliar printed words; and be given ample practice in using each set of strategies, both in isolation and in text reading.
The ISA is also based on the related premises that the process of constructing meaning from text is dependent upon: relatively effortless identification of a high percentage of the words in the text; syntactic and semantic knowledge; content relevant background knowledge, and motivational and intentional factors that result in active engagement (Guthrie & Wigfield, 2000; Sweet, Guthrie, & Ng, 1998). Finally, ISA assumes that reading instruction must be tailored and responsive to the children’s identified needs rather than be scripted or uniformly programmed.

A Brief Review of Studies of the ISA

We and our colleagues developed and tested the ISA across three large scale studies that have spanned nearly two decades (Scanlon, Gelzheiser, Vellutino, Schatschneider, & Sweeney, 2008; Scanlon, Vellutino, Small, Fanuele, & Sweeney, 2005; Vellutino et al., 1996). In each study, the use of the approach was effective in reducing the incidence of reading difficulties. In all studies an emphasis was placed on small group and/or one-to-one instructional formats and a similar lesson format was used. The lessons were comprised of five or six components. The focus of those components varied, of course, depending on children’s knowledge and skills. The components are listed below:

1. Read Aloud, Shared Reading or Re-reading

2. Phonological Skills
   a. Phonological Awareness – integrated with alphabetics activities once children had some insight into the fact that spoken words are comprised of somewhat separable sounds.
b. Alphabetics (letter names, letter sounds, and various types of word work) – the focus during this component was generally on a decoding element that would be encountered in the new text for the day.

3. Reading New Book(s) – with guidance focused on both strategic word solving and comprehension and enjoyment of the text

4. Modeled, Shared or Supported Writing – often in response to one of the books read during the lesson.

5. High Frequency Word Practice

In the earliest study (Vellutino et al. 1996), children identified as having severe reading difficulties in mid-first grade were randomly assigned to either a “business as usual” (BAU) control group or to a one-to-one tutoring condition with tutors trained in an early version of the ISA. Children in the intervention group significantly outperformed the children in the BAU group and many of the children reached or exceeded grade level expectations in reading. However, 15 percent of the children in the ISA tutoring group continued to score below the 15th percentile. Further, it was clear that intensive one-to-one intervention was not sustainable on a large scale. Therefore, a second study was undertaken with the dual goals of reducing the number of children who needed intensive intervention in first grade and of improving the outcomes for the children who continued to struggle despite the one-to-one tutoring.

In the second study, we evaluated the effects of beginning intervention efforts in kindergarten for children who were considered to be at increased risk of experiencing reading difficulties based on assessment of early literacy skills at kindergarten entry. At risk children from within participating classrooms were randomly assigned to intervention and BAU control conditions. Intervention involved an additional 30 minutes of small group (usually three children
per group) instruction provided twice per week by a certified teacher trained in the ISA. Kindergarten intervention was effective in reducing the number of children who qualified for intervention in first grade, particularly in schools that provided no support services for the children in the BAU group.

Children who did qualify for intervention in first grade were randomly assigned to one of three treatment conditions in first grade: a BAU condition and two one-to-one tutoring conditions that were variants of the ISA (one emphasized the phonological skills component of the lesson and the other emphasized the reading and re-reading components). Children in both ISA tutoring conditions out performed students in the BAU group and there were no significant mean differences between the ISA tutoring conditions. There were, however, distributional differences between the two conditions with the Text Emphasis condition producing more children who scored above the 50th percentile and more children who scored below the 15th percentile as compared with the Phonological Skills Emphasis condition. These results suggested that the Text Emphasis condition did not effectively meet the needs of the children who had difficulty acquiring skill with the alphabetic code and that the Phonological Skills Emphasis condition did not provide children with sufficient opportunity to engage in supported reading of appropriately challenging texts. As a result of this finding, we currently encourage teachers to adjust the emphasis they place on the development of the phonological skills versus engagement with reading in accord with the skills of the children with whom they work.

Another major finding from this study was that, across all three first grade conditions, children who had participated in the ISA intervention in kindergarten were less likely to score below the 15th percentile at the end of first grade and more likely to score above the 50th percentile than were children who were in the BAU group in kindergarten. This was true even
though children who participated in intervention in kindergarten and nevertheless qualified for intervention in first grade might be considered to be more challenging to accelerate while the BAU group was likely comprised of an admixture of children who were relatively easy to accelerate and those who were more challenging. These findings clearly suggest that addressing the needs of children who appear to be at risk for literacy learning difficulties as early as their risk status can be identified can have long term benefits for the children and at a relatively low cost. The kindergarten intervention program involved approximately 25 hours of small group instruction distributed across the school year (October through May).

The third major study, a portion of which is the focus of this paper, explored the potential utility of providing kindergarten and first grade classroom teachers with ISA-based professional development as a means of helping them to become more effective in addressing the needs of the struggling literacy learners in their classrooms. The effectiveness of professional development for classroom teachers (PD Only) was contrasted with two other conditions, one that involved providing small group intervention for kindergartners and one-to-one intervention for first graders (I Only) and a second which involved providing both professional development for classroom teachers and interventions for struggling learners (Both).

Three cohorts of entering kindergartners were studied from the time they entered kindergarten until the end of second or third grade. The first cohort served as a Baseline group. No attempt was made to influence the instruction they received as they moved through the primary grades. The second cohort served as the Implementation group. For schools in professional development conditions, the kindergarten classroom teachers participated in professional development in the summer before and the year during which they taught this group of children. First grade teachers participated in the professional development the following year.
(the year when they taught the implementation cohort). The third group of kindergartners served as the Maintenance cohort. Teachers taught this group in the year after the professional development program had been provided.

In reporting on outcomes at the kindergarten level, Scanlon et al. 2008 indicated that comparisons of the Baseline cohort with each of the other two cohorts revealed that the three treatment conditions were equally effective in reducing the number of children who qualified as at risk for reading difficulties from the beginning to the end of the kindergarten year. That is, substantially fewer children in the Implementation and Maintenance cohorts than in the Baseline cohort scored in the at risk range at the end of kindergarten. Scanlon et al. also reported that several characteristics of classroom language arts instruction changed from the baseline to the implementation and maintenance years in ways that were consistent with the professional development that was provided.

In this paper, we focus on results at the first grade level for children in the PD Only condition as our goal is to link to the logic of integrating the content of the professional development program into pre-service coursework designed to prepare classroom teachers. We begin by discussing the content and approach to professional development and then describe the PD only condition in some detail including the procedures, results, and implications.

ISA Professional Development for Classroom Teachers

Consistent with the views of Wei, Darling-Hammond, Andree, Richardson, and Orphanos (2009), professional development in this study was both externally provided and job-embedded. Teachers participated in both a summer workshop and in-school observations and collaborative meetings. The ISA Professional Development workshop was organized around a set of instructional goals for the child. As each goal was discussed, research related to the goal was
reviewed and instructional approaches to helping children to achieve the goal were discussed and modeled. Teachers were also given opportunities to analyze student work samples and to consider appropriate next steps for instruction. Below is the listing of instructional goals, taken from the teacher “handbook” (Scanlon & Sweeney, 2004)¹ which was provided to participating teachers:

1) **Motivation to Read and Write** - the child will develop the belief that reading and writing are enjoyable and informative activities which are not beyond her capabilities.

2) **Phoneme Awareness** - the child will have a conceptual grasp of the fact that words are made up of somewhat separable sound segments. Further, the child will be able to say individual sounds in simple words spoken by the instructor and to blend separate sounds to form whole words.

3) **Letter Identification** - the child will be able to name, rapidly and accurately, all 26 letters of the alphabet, both upper and lower case versions.

4) **Letter-Sound Association** - the child will be able to associate the sounds of the majority of consonants with their printed representations.²

5) **Alphabetic Principle** - the child will understand that the letters in printed words represent the sounds in spoken words. Further, the child will be able to change single consonants at the beginning or end of one-syllable words in accord with requests made by the tutor (e.g., "change mat to bat").

¹ Note that the teacher handbook has gone through several iterations since the 2004 version which was used in the research study currently under discussion and the most recent version has been published in book form (Scanlon, Anderson, & Sweeney, 2010).

² An explanation of the logic for the ordering of these goals is beyond the scope of this paper. However, as it is likely that some would question whether learning about vowel sounds was/is a component of the ISA, we note that vowels were a focus of instruction related to Goal #11.
6) **Print Awareness** - the child will understand that the purpose of print is to communicate.

7) **Print Conventions** - the child will understand some of the most basic print conventions, such as the left to right and top to bottom sequencing of print, where to begin reading a book, the concepts of letter and word, etc.

8) **Whole Word Identification** - the child will learn to recognize, at sight, a set of high frequency words.

9) **Comprehension** - the child will develop comprehension skills and strategies that will enhance his ability to construct the meaning of texts heard or read.  

10) **Vocabulary and Oral Language Development** - the child will learn the meanings of new words encountered in instructional interactions and be able to use those words conversationally. Further, the child’s ability to understand and use more complex grammatical structures will improve.

11) **Decoding and Encoding Strategies** – The child will develop the ability to use both single letter phonics and a variety of spelling patterns (phonograms, prefixes, and suffixes, etc.) to decode and spell individual words.

12) **Whole Word Identification** – The child will be able to quickly and accurately identify a large number of high frequency words.

13) **Strategic Word Identification** – The child will develop flexibility and independence in applying a variety of strategies to facilitate the identification of unfamiliar words encountered in text.

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3 Although the description of this goal does not specifically address the need for teachers to focus on helping the children to develop the background knowledge they will need in order to comprehend the progressively more challenging texts that they will encounter in subsequent grades, this was a major topic in discussions of this goal.
In addition to discussion of the goals, several general principles and premises for preventing reading difficulties were presented and repeatedly discussed during the workshops and revisited frequently in grade level meetings that occurred in teachers’ home schools. The principles included:

1) **Adopt a Vygotskian Perspective on Teaching and Learning** – In discussing this principle, an emphasis was placed on the important role that careful verbal guidance plays in directing and guiding children’s problem solving skills and on the importance of providing instruction that is within the child’s zone of proximal development (Vygotsky, 1978).

2) **Promote Engagement Opportunities for All Students** – Discussion related to this principle focused on the tendency of some children to not become engaged in the thinking that leads to learning – such as when a child becomes overly invested in arts and crafts components of tasks that are intended to support the development of foundational literacy skills, or when a child echoes the responses of his neighbors during instructional activities that call for a choral response. Teachers were encouraged to incorporate opportunities for Every Student Response into their instructional activities and to try to ensure that the thinking that students engaged in during instructional activities served to move them forward as literacy learners.

3) **Set High Expectations for All Children** – Research on the benefits of early literacy interventions and on the findings in “Beat the Odds” schools (e.g., Taylor, Pearson, Clark, & Walpole, 2000) was discussed by way of emphasizing that
virtually all children can learn to read if provided with effective instruction from teachers who expect the children to achieve.

4) **Interface Support Services with the Classroom Program** – In discussing this principle, an emphasis was placed on helping teachers to gain insight into how children who receive instruction in multiple settings might become confused when there is little congruence across settings. We argued that increasing the congruence across settings would serve to better prepare children to succeed in all settings.

**Research Questions**

The major question addressed by the PD Only condition of the larger study was whether participation in ISA professional development would enhance teachers’ ability to improve early literacy outcomes for their students, particularly students who were identified as being at risk of experiencing difficulties with literacy acquisition. This question was addressed by assessing children’s early literacy skills at the beginning and end of kindergarten and first grade. A related question which we will touch on briefly was: In what ways do teachers’ practices change following participating in the ISA professional development program?

**Procedures**

**Subjects**

*Schools and Teachers*: Schools serving relatively high numbers of low income students were recruited for this study. In order for a school to qualify to participate, at least 80 percent of the kindergarten and first grade classroom teachers needed to agree to participate as subjects over the course of 3 years (as they taught the Baseline,
Implementation, and Maintenance cohorts). Teachers submitted consent forms in sealed envelopes directly to the research center in order to avoid coercion from peers and/or administrators. Fifteen schools ultimately enrolled in the study. On average, each school had 2 to 3 teachers at each grade level who agreed to participate. All participating teachers were female and white and the vast majority had at least 3 years of teaching experience at their grade level. Most had 10 years of experience or more.

To encourage participation on the part of teachers, instructional materials were offered as an incentive. Each first grade teacher who agreed to participate was provided with approximately $4000 with which to purchase books and other instructional materials to be used in literacy/language arts instruction. The materials were provided at the beginning of the year in which the teachers taught the baseline cohort so the effects of infusion of new materials was not confounded with the effects of involvement in professional development.

Children: All entering kindergartners, over a three year period, were recruited for the study via permission slips distributed to their parents. Many schools elected to distribute the consent forms at kindergarten orientation or open house. As a result, the response rate was unusually good. Over 90 percent of the children received permission to participate. The percentages of children qualifying for free and reduced priced lunch was calculated separately for each cohort within each condition and ranged from a low of 25 percent to a high of approximately 51 percent. Seventy to 90 percent of the children in each cohort by condition were white. The second largest racial group was African American. At the beginning of kindergarten, approximately 750 children entered were enrolled in each cohort. These children were approximately equally distributed across the
conditions. By the end of first grade, the number of children remaining in the three cohorts of the PD Only condition was as follows: 188 Baseline, 190 Implementation, and 164 Maintenance.

**Assignment of Schools to Treatment Conditions**

From the 15 schools agreeing to participate in the study, three groups of schools were formed such that the groups were roughly matched on the basis of population characteristics such as the percentage of children who qualified for free and reduced-price lunch, their ethnic diversity, the performance level of their incoming kindergartners, and the schools’ historical performance levels on the New York State fourth grade English Language Arts assessment. These three groups of schools (5 schools per group) were randomly assigned to one of three treatment conditions.

**Student Assessments**

The Baseline and Implementation groups were followed through assessments of literacy and language skills from kindergarten entry through the end of third grade. The Maintenance group was followed through the end of second grade (June 2007) and will not be followed further as grant funding has ended. For this paper, we focus on two measures of early literacy skill.

**PALS.** The kindergarten version of the Phonological Awareness and Literacy Screening Battery (PALS - K, Invernizzi, Meir, Swank & Juel, 1999-2000) was administered to kindergartners at the beginning and end of the school year. This is a standardized measure that provides benchmarks for the identification of children who are at risk for literacy learning difficulties. The Rhyme Awareness, Beginning Sound Awareness, Alphabet Knowledge, Letter-Sound Knowledge and Spelling components were administered. The maximum score summing these subtests is 92 points. Risk status at each measurement point was based on the published benchmark (28 in the Fall and 74 in the Spring). Internal consistency reliability coefficients
based on the subtests range from .79 to .85 for various subsamples (Invernizzi, Meier, Swank, & Juel, 2000).

The PALS 1-3 (Invernizzi & Meir, 2000-2001) was administered at the beginning of first grade. The outcome measure utilized for this study was the Entry Level Summed score which is the sum of the Spelling and Word Recognition components. The maximum possible score for this index is 77. The test manual reports reliability and validity indices within acceptable ranges (.73-.90). This measure also provides a standard benchmark for demarcating risk status.

**Basic Reading Skills Cluster.** At the beginning of grade 1, all students were administered subtests from the Woodcock-Johnson III Tests of Achievement (WJIII, Woodcock, McGrew, & Mather, 2001). Scores from the Letter-Word Identification and Word Attack subtests were used to derive a Basic Reading Skills Cluster (BSC) score. For four to seven year olds, the age-corrected test-retest reliability coefficient for a one year interval is .92. In this study, the beginning of first grade PALS Summed Score correlated .88 with the BSC.

**Professional Development**

Teachers participated in a four day professional development workshop during the summer before they taught the Implementation cohort of children. The workshop focused on the goals and premises of the ISA as described above. A member of the research staff who had expertise relative to the ISA was assigned as collaborator/coach to each school during their implementation year. The collaborator conducted monthly group meetings with the participating teachers during which the content of the workshop was revisited and the group worked through how the goals discussed in the workshop could be addressed in the context of the curriculum which was in place. In addition, the collaborator observed each teacher during the context of language arts instruction a minimum of 5 times and met with the teacher thereafter to debrief.

Classroom Observations (for Data Collection Purposes):
To document potential changes in language arts instruction that might be attributable to the teachers’ involvement in professional development, all participating teachers were observed on five occasions as they taught each cohort. Observations generally lasted 2 to 2 ½ hours and were scheduled to coincide with the times that the teachers identified as the primary language arts instructional block. Observations were conducted using the Classroom Language Arts Systematic Sampling and Instructional Coding system (CLASSIC; Scanlon, Gelzheiser, Fanuele, Sweeney, & Newcomer, 2003) which was developed for use in this project. The CLASSIC is a modified time-sampling observation system, in which the observer uses a laptop computer to record both a running narrative of all of instructional events which involve the teacher and to sample events to be coded. The observer receives an auditory prompt every 90 seconds that signals her to record verbatim a “slice” or instructional event. This slice is then coded for seven features of elementary-level language arts instruction. Six of the seven features focus on the teacher; the seventh feature captures the students’ response. We also calculated the total number of slices in which active language arts instruction was observed. A complete description of this coding system and the data which it generated is beyond the scope of this paper. However, to assist in the interpretation of the student outcomes which are the major focus of the paper, a few of the salient findings derived from these data are reported.

Results

We have three full years of data on a total of 10 teachers in the PD Only condition. Data from students in these teachers’ classes will be the focus of the following analyses. The major question addressed in this condition of the larger study was whether teachers’ engagement in professional development would enhance their ability to meet the needs of their struggling learners and thereby reduce the number of children who performed in the range that would indicate that they were at risk for reading difficulties. Scanlon et al. (2008) found clear evidence that this was the case.
at the kindergarten level. As a result there was a substantially higher percentage of children who qualified as at risk when the Baseline cohort entered first grade than when the Implementation and Maintenance cohorts did (see Figure 1).

Figure 1. Percentages of children qualifying as at risk at the end of kindergarten

| Percentage of Children Qualifying as At-Risk at the End of K |
|------------------|------------------|------------------|
|                  | BASELINE          | IMPLEMENT        | MAINTENANCE      |
| Percentage       | 30                | 20               | 15               |
|                  | 25                | 20               | 15               |
|                  | 20                | 15               | 10               |
|                  | 15                | 10               | 5                |
|                  | 10                | 5                | 0                |

Figure 2 presents more detailed but similar results at the beginning of grade 1. Here it can be seen that the percentages of children who did not qualify as at risk all changed in the desired directions from the Baseline cohorts to the Implementation and Maintenance cohorts. In fact, while in the Baseline cohort nearly 40 percent of the children qualified as at risk at the beginning of first grade (At Risk Grade 1 only + At risk K & 1) only about 20 percent of the children (Not At Risk K&1 + At Risk K only) qualify as at risk in the Implementation and Maintenance cohorts.
These differences in performance levels at the beginning of first grade complicate interpretation of the effects of the professional development at the first grade level because, for the teachers, there was a change in both the make-up of their classes and in their professional knowledge related to literacy development when they began to teach the Implementation cohort as compared to the Baseline cohort. Therefore, when comparing the performance levels of the various risk groups across cohorts it is important to keep this distinction in mind. For example, in comparing the progress of children identified as at risk at the beginning of both kindergarten and first grade in the Baseline cohort with that of the At-Risk K & 1 groups in the Implementation and Maintenance cohorts, consideration needs to be given to the fact that the children in the latter two cohorts are likely to be a “needier” group given that they remained at a low performance level even though they, presumably, had experienced a more effective language arts program in kindergarten.

Table 1 compares the performance levels for children across three cohorts who qualified as at risk in kindergarten but not in first grade. Perusal of the table will reveal that, especially at the end of first grade, the children in the implementation cohort performed substantially better than the children in the Baseline cohort, gaining 8 Standard Score points during their first grade year (equaling an effect size of
approximately 1.0) while their peers in the same classrooms the year before showed no gain on standard scores (which doesn’t mean that they didn’t make progress, they simply didn’t change their status relative to national norms). There was also a suggestion that the children in the Maintenance cohort made greater gains during first grade than did the children in the Baseline cohort.

Table 1. Performance levels on the Basic Skills Cluster for children who were identified as at risk in Kindergarten but not in Grade 1.

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<thead>
<tr>
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<th>At Risk - K Only</th>
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<tbody>
<tr>
<td></td>
<td>fall first</td>
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<tr>
<td></td>
<td>N  %  Mean  Std</td>
</tr>
<tr>
<td>Baseline</td>
<td>39  20.7  110.44  6.78</td>
</tr>
<tr>
<td>Implementation</td>
<td>52  27.4  107.85  8.47</td>
</tr>
<tr>
<td>Maintenance</td>
<td>48  29.3  110.92  7.53</td>
</tr>
</tbody>
</table>

Another bit of evidence that points to the efficacy for the interventions in both kindergarten and first grade can be found in perusal of the data for children who did not qualify as at risk at kindergarten entry but did qualify at the beginning of first grade (see Table 2). First, it is important to note that the numbers in these groups are small. And, it is noteworthy that, as compared with the Baseline cohort, the number of children who had this profile in the Implementation and Maintenance cohorts was substantially smaller. Moreover, although it is a small group, it is clear that the children in the Implementation cohort made stronger gains relative to national norms than did the students in the Baseline cohort. The Maintenance cohort, however, did not demonstrate the same pattern.
Table 2. Performance levels on the Basic Skills Cluster for children who were identified as at risk in Grade 1 but not in kindergarten.

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<td></td>
<td>N</td>
<td>%</td>
<td>Mean</td>
<td>Std</td>
<td>Mean</td>
<td>Std</td>
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<tr>
<td><strong>Baseline</strong></td>
<td>18</td>
<td>9.5</td>
<td>96.78</td>
<td>7.40</td>
<td>99.31</td>
<td>11.86</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td>6</td>
<td>3.2</td>
<td>96.67</td>
<td>2.16</td>
<td>104.25</td>
<td>9.39</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>7</td>
<td>4.2</td>
<td>98.57</td>
<td>6.11</td>
<td>100.29</td>
<td>8.75</td>
</tr>
</tbody>
</table>

Table 3 presents the results for the children who qualified as at risk at the beginning of both kindergarten and first grade. The first finding of note is that there was a substantial reduction in the number and percentage of children with this profile in the Implementation and Maintenance cohorts as compared with the Baseline cohort. Children in the Implementation and Maintenance cohorts who didn’t benefit sufficiently from the (presumably) enhanced instruction offered in kindergarten were likely to be among the most challenging students to accelerate. The children in the Baseline cohort, on the other hand, may have been more of an admixture of students who were genuinely hard to accelerate and those who would not have qualified as at risk in first grade had they received more effective instruction during their kindergarten year. Perusal of the data will reveal that the “needier” groups in the Implementation and Maintenance cohorts gained approximately the same amount during their first grade year as the children in the Baseline cohort. This may suggest that the teachers were better able to meet these students’ needs, but the evidence for this is tenuous especially in light of the fact that, at the first grade
level, the participating schools provided additional support services for the children who were struggling with literacy acquisition.

Table 3. Performance levels on the Basic Skills Cluster for children who were identified as at risk in both Kindergarten and Grade 1.

<table>
<thead>
<tr>
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<th>At Risk - K and G1</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>Mean</td>
<td>Std</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Baseline</strong></td>
<td>52</td>
<td>27.7</td>
<td>93.06</td>
<td>9.10</td>
<td>101.22</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td>37</td>
<td>19.5</td>
<td>94.97</td>
<td>7.48</td>
<td>99.62</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>29</td>
<td>17.6</td>
<td>95.59</td>
<td>8.13</td>
<td>102.21</td>
</tr>
</tbody>
</table>

The last group considered in this series of analyses is the group comprised of children who did not qualify as At-Risk in either kindergarten or first grade (see Table 4). Consistent with previous findings, there were larger numbers and higher percentages of children in this group in the Implementation and Maintenance cohorts than in the Baseline cohort. Further, the mean performance levels of all groups were substantially above average and the groups’ standings relative to national norms were stable from the beginning to the end of the school year. While these data do not suggest that professional development for first grade teachers had a positive impact on student achievement among students who never performed in the at risk range, the outcomes do suggest that the teachers’ greater success with children who had struggled or who were struggling did not come at the expense of effective instruction for the children who were never at risk.
Table 4. Performance levels on the Basic Skills Cluster for children who were never identified as being at risk in Kindergarten or Grade 1.

<table>
<thead>
<tr>
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<th>Not At Risk - K and G1</th>
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<tbody>
<tr>
<td></td>
<td>fall first</td>
<td>spring first</td>
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<td></td>
<td>N</td>
<td>%</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Baseline</strong></td>
<td>79</td>
<td>42.0</td>
<td>116.03</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td>95</td>
<td>50.0</td>
<td>118.76</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>80</td>
<td>48.8</td>
<td>119.18</td>
</tr>
</tbody>
</table>

To evaluate whether engagement in the ISA professional development activities was associated with observable and sustained changes in instructional practices, we are in the process of analyzing data collected via the CLASSIC observation system. Because we are particularly interested in changes that extend beyond the year in which the teachers were actively engaged in professional development, we are comparing observation data from the Baseline and Maintenance years. For each year, the number of observational “slices” in which particular teaching activities/practices/foci were observed across the five observations was tallied and the tallies were compared across years. Figure 3 depicts the effect sizes\(^4\) for the largest differences that were detected between the Baseline and Maintenance years. All effect sizes reflect a greater incidence of particular instructional activities/practices/foci during the Maintenance year.

The results suggest that Maintenance cohort children engaged in substantially more reading that did their Baseline counterparts and experienced a greater instructional focus on vocabulary and language, on sight vocabulary, and on comprehension. Further, they more often received instruction in small, skill-based homogeneous groups and, overall, were engaged in

\(^4\) The standard deviation for the Baseline cohort was used as the divisor.
more active language arts instruction. It is important to note that, although the largest effects were observed for sight words and homogeneous grouping, these effects are due partially to the fact that these activities were rarely observed during the Baseline year and thus even small increases in total time devoted to these activities could yield large effect sizes. For example, the use of homogeneous grouping was coded only two percent of the time during the Baseline year while it was coded 10 percent of the time during the Maintenance year. It is also important to note that the data presented in Figure 3 relate to all observations of particular activities. Thus, for example, a focus on sight words or vocabulary and language was counted in all contexts in which it occurred (i.e., whole class instruction, small homogeneous groups).

![Figure 3. Effect Sizes for Aspects of Language Arts Instruction where Moderate to Large Increases were Observed from Baseline to Maintenance Years](image)

**Discussion**

In this paper we reviewed the research basis for the Interactive Strategies Approach (Scanlon et al., 2010; Vellutino & Scanlon, 2002) to early reading instruction
and intervention; briefly described the ISA professional development program, focusing on the instructional goals and guiding principles of the approach; and presented evidence of the effectiveness of the professional development in enhancing in-service teachers’ ability to address the literacy learning needs of children identified as at risk of early reading difficulty in kindergarten and first grade. This paper connects to Papers 2 and 3 in this symposium by providing the historical context and theoretical rationale for undertaking the research described in Paper 2, as the content of the ISA professional development program described herein served as the point of departure for the development of instructional resources to be used in pre-service methods courses focusing on literacy development in the early primary grades.

Across a series of longitudinal studies, the ISA has been found to be effective in reducing the incidence of reading difficulties when implemented in small group and one-to-one tutoring contexts (Scanlon et al., 2005, 2008; Vellutino et al., 1996) and when implemented by kindergarten teachers who participated in professional development based on the ISA (Scanlon et al., 2008). In this paper, previously unpublished results from Scanlon et al. (2008) extend the kindergarten findings to first grade teachers and their students, and further highlight the important role of classroom instruction in reducing early reading difficulties.

Using historical control groups, findings at the first grade level indicated that, as compared with the baseline year, teachers who participated in ISA professional development were successful in increasing the early literacy skills of students who had at some point in kindergarten or first grade been identified as being at risk of experiencing literacy learning difficulties. Interpretation of the current data is complicated a bit by the fact that comparisons between the Baseline cohort and the Implementation and
Maintenance cohorts need to take account of both the overall achievement levels and the percentage of children who qualified for particular groups. Owing to the success of the kindergarten teachers who were also participants in the professional development program, fewer children arrived in first grade with weak early literacy skills in the Implementation and Maintenance cohorts than in the Baseline cohort. Therefore, at the first grade level, the at risk students with whom the teachers worked were, most likely, a more challenging group to teach. Therefore, first grade teachers’ success in advancing the skills of children in this group to the point where they equaled the skills of a group that wasn’t as needy is important to consider. Also noteworthy is the teachers’ success in accelerating the progress of children who were identified as at risk at the beginning of kindergarten but not at the beginning of first grade. In the Implementation cohort, this group showed a gain of 10 standard score points during first grade. This amount of gain is impressive particularly in comparison to the absence of a change in standard scores for the children with the same profile in the Baseline cohort. Finally, with regard to student achievement measures, it is important to note that teachers’ enhanced effectiveness with their at-risk learners did not compromise their effectiveness with more typically-developing students, as they continued to perform at or above average across the Baseline, Implementation, and Maintenance cohorts.

With regard to observations of classroom language arts instruction, we provide some preliminary analyses of changes in instruction between the Baseline and Maintenance years to illustrate some of the ways in which involvement in ISA professional development may have had a longer term impact in teaching practices. Virtually all of the large changes that were identified are in the direction that is consistent
with practices advocated in the professional development program (and with best practices more generally). For example, when compared to the baseline cohort, students in the maintenance cohort were engaged in more active language arts instruction, were more likely to receive instruction in small, skill-based homogeneous groups, and engaged in substantially more reading overall. Paralleling the findings at the kindergarten level (Scanlon et al., 2008), the first grade outcomes for both teachers and students demonstrate that classroom teachers who participate in professional development based on the ISA can become substantially more effective in improving the early literacy outcomes of their at-risk students. Importantly, these improved outcomes are not tied to the implementation of a highly scripted curricula or the adoption of specific instructional materials. Rather, we believe that they are the outgrowth of enhanced teacher knowledge and reflect the teachers’ improved ability to analyze and appropriately respond to the instructional needs of their at-risk students.

Finally, it should be noted that, although we did not formally assess the teachers’ attitudes about the professional development program nor seek their opinions about how their instruction had changed (which, in retrospect, we should have) our general sense was that the teachers felt re-invigorated by the knowledge they gained during the course of the professional development. Indeed, it was comments from teachers that led us to pursue the pre-service project that is the focus of this symposium. As one teacher put it: “Is this what new teachers are learning? They should be!”
Acknowledgements

This project was supported by an IERI grant funded by the National Institute of Child Health and Human Development (grant number 1R01HD42350). The authors express their sincere gratitude to the students, and secretarial and administrative staff in participating schools. We are especially grateful to the teachers who allowed us into their classrooms to watch, learn, and collaborate on ways to enhance young children’s literacy development. Finally we thank Joan Sweeney and Peggy Connors who served as collaborators and coaches for this project.
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