Discovery Bags: Home-School Connections for Preschoolers

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Parent Participation, Preschool, Mathematics, Reading

Abstract

The purpose of this project was to look at how parent involvement affects literacy and mathematics development for special needs and typically developing preschoolers. We created Discovery Bags that used picture book(s) to reinforce early literacy skills and to teach a specific math skill. Activities were completed at home with the parent on a weekly basis for twelve consecutive weeks. Specific instructions were included in the Discovery Bags so parents knew how to use them appropriately. Ten target students' mathematics and literacy skills were evaluated on pre- and posttests. Both special needs youngsters and their typically developing peers made substantial growth in reading and mathematics during the 2006-2007 academic year; while there were other factors contributing to this growth, some of the progress is likely to have resulted from parent involvement and extra practice.

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Introduction

As a result of *No Child Left Behind*, teachers everywhere are feeling pressure to raise student achievement in reading and mathematics. Educators all over the United States are looking for support to help students achieve the goals set in this legislation. Preschool educators are now more accountable for student learning. In fact, specific academic content standards for children between the ages of 3-5 have been created. Fulfilling state standards in all academic areas, building social skills, and providing motor experiences for all preschoolers is a heavy load for a program that generally meets only 10 hours per week. It is impossible for a preschool program to provide all a child needs to become successful in subsequent school experiences.

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One avenue that is being explored to boost student achievement is parent involvement. Although most research on parent participation and student achievement in early childhood has focused on K-3 grade levels, some of the findings shed light on factors that can apply to preschool home-school activities. Common benefits of parent participation include increased parental understanding of their children's skills, enthusiasm resulting from student growth, and enjoyment of activities and the shared time (Richgels & Wold, 1998; Handel, as cited in Cairney, 2002). A major advantage of this collaboration is that the child sees the value of what he or she learns in school because this learning is applied at home. Parents and students are more likely to benefit from this participation when teachers provide some sort of training or guidance to facilitate the home-school activity (Cotton & Wikelund, 2001). It is also important to note that the earlier parent involvement begins, the greater the impact.

Home-School Partnerships

While the idea of a home-school partnership is supported by early childhood theory and research, the results of such programs have been questioned. Researchers criticize home-school projects because they often have little meaning due to a lack of explicit direction provided to parents (Cairney, 2002; Metsala, 1996; McCarthey, 2000; Cotton & Wikelund, 2001). Auerbauch (as cited in Cairney, 2002) argues that parents often lack the skills necessary to promote success in their children; therefore, the usefulness of the activity is minimized. Poorly designed home-school projects have caused critics to make negative judgments about their overall effectiveness.

Experts agree that preschool literacy should be authentic, meaningful, and integrated across the curriculum (Morrow, 2004; Barclay, Benelli & Schoon, 1999). The opportunities to engage young children in literacy activities are endless, as children's books are a natural springboard for all academic areas (Barclay, Benelli, & Schoon, 1999). Books are a common tool that parents are comfortable using to enhance their

children's education. Educators should capitalize on this opportunity to extend parent participation.

One possibility for successful home-school connections involves the use of trade books and extension activities packaged in bags and circulated among the children in class. Two book-in-the-bag projects reported in the literature were developed to boost parent and child engagement in book reading and other activities (Dever & Burts, 2002; Barbour, 1998/99). Bags included quality children's books, guidelines/instructions to complete activities, and surveys and questionnaires to obtain data. The results of each book-in-the-bag study demonstrated that the activities were beneficial. In addition to enhanced literacy skills, other outcomes emerged. Both studies found that parents gained a better understanding of their child's academic skill level, were reminded to make book reading interactive, and were able to share curriculum-related interactions with their children. They also noted that the children were enthusiastic about taking the book bags home (Dever & Burt, 2002; Barbour 1998/99). Positive effects of book-in-the-bags that combine literacy activities with parent involvement have been documented. Further research is necessary to determine whether the positive impact can be generalized beyond reading. Barclay, Benelli, and Schoon (1999) successfully implemented a literacy bag project that included science-related activities. Their bags had a positive impact on both students and parents. While there has been very little work done with content area extensions, a developmental perspective would suggest that integrating reading and other content learning through home-school activities should be beneficial for young children.

Developmental Theories

One common benefit of book-in-the-bag projects is that they center on the social and interactive aspect of a child's learning regardless of the specific activities included in each bag. Children manipulate materials and books provided and construct new knowledge as they explore the book-in-the-bags. Parents are in a position to support and facilitate their child's learning. Such an approach is supported by many educational theories.

A Constructivist approach to teaching and learning, an outgrowth of the work of Jean Piaget and Lev Vygotsky, is commonly seen in early childhood classrooms/centers and is considered to be developmentally appropriate practice (DAP). Constructivism has the following four tenets: a) Students actively construct knowledge by exploring their own ideas, rather than passively acquiring knowledge; b) Prior knowledge is the foundation for present and future learning, but this knowledge is continually being reconstructed; c) Social interactions and situations lead to new knowledge and concepts; and d) Through hands-on experiences, students expand and revise their knowledge (Ordstein & Levine, 2000). "Children cannot successfully construct if they have neither the prerequisite cognitive skills nor the educational support necessary to acquire the skills first" (Wadsworth, 1996, p.155). New knowledge is built on prior knowledge; through disequilibration (the process of incorporating new knowledge with already established knowledge), cognitive growth occurs (Wadsworth, 1996).

Vygotsky expanded our understanding of child development by exploring the social aspects of learning. “Vygotsky suggested that cognitive development depends much more on interactions with the people in the child’s world and the tools that the culture provides to support thinking. Children’s knowledge, ideas, attitudes, and values develop through interactions with others” (Tracey and Marrow, 2006, p. 108). Learners shape their own interpretation of social (public) knowledge (giving it their own meaning). This process results in an understanding that is personal and unique to each individual (Richgels & Wold, 1990; Podell, 2000). Scaffolding and the Zone of Proximal Development (ZPD) are two key concepts in Vygotsky’s theory. Scaffolding involves providing support so that the child can handle more complex tasks (Tracey and Morrow, 2006). In order for scaffolding to be successful, an adult or more knowledgeable peer must work with the learner’s Zone of Proximal Development, the “place” slightly above a child’s current independent abilities (Richgels & Wold, 1990).

Context

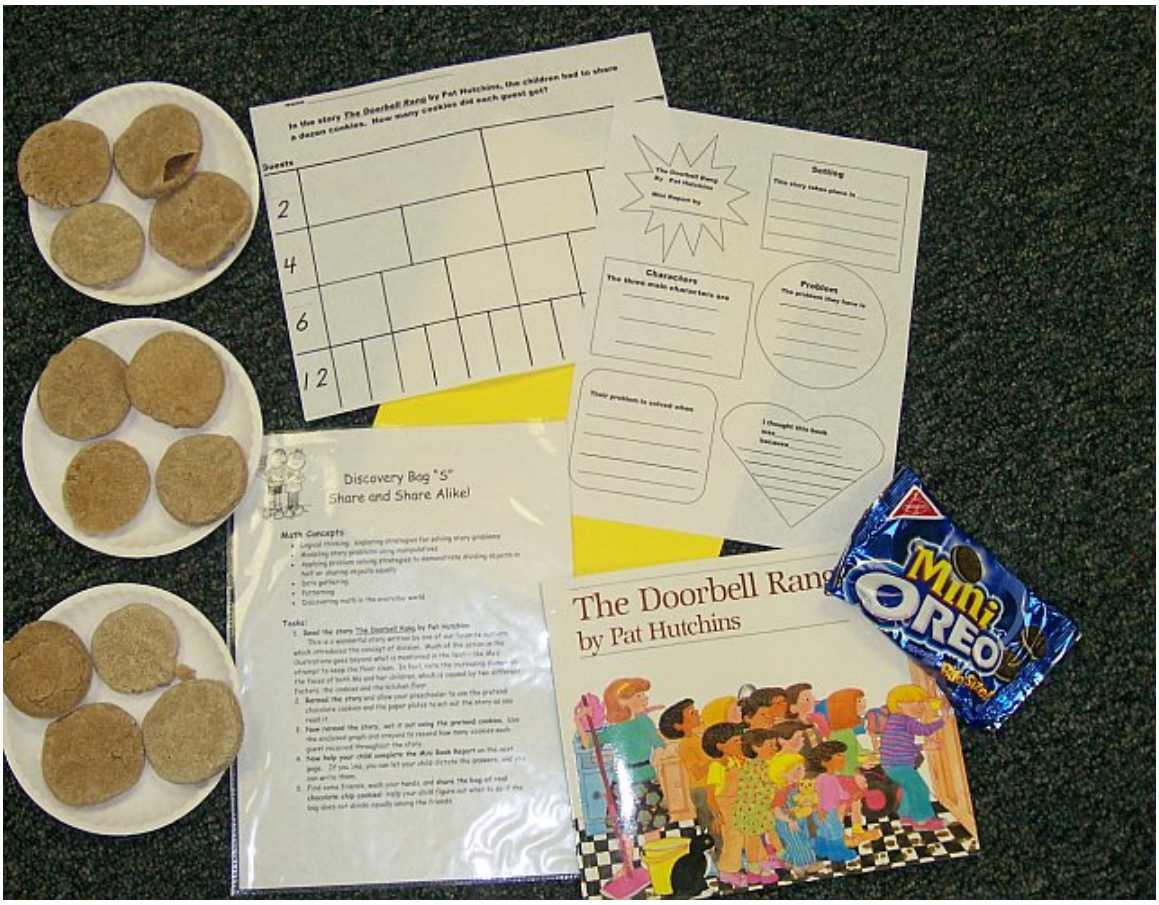
This study included students in two Westerville, Ohio special needs preschool classrooms, one unit at Robert Frost Elementary and one unit at Whittier Elementary. There are currently 141 students identified as “preschoolers with a disability” and 71 typically developing peers in the district’s preschool classrooms. The students chosen for this study attend the afternoon class at their respective schools. These students are 4 to 6 years old. Most of the students come from college educated, middle to upper- class families who value education and are very involved in their child’s education.

The Robert Frost classroom has twelve students (ten boys, two girls). All parents in this class chose to give permission for their child to be included in this study. For the purpose of this study, all twelve students were tracked for participation purposes. Of the twelve students, five (two peers, three students with special needs; four boys, one girl) were randomly selected for data collection on achievement.

The Whittier classroom contains eleven (six boys, five girls) students. One parent did not give permission for their child to be a part of the study, so the child was excluded. The ten remaining students were tracked for participation results, while five (three peers, two students with special needs; three boys, two girls) students were randomly selected for data collection on achievement.

The Discovery Bag Project

As two young and energetic preschool teachers, we are always looking for valid, authentic, and meaningful activities to enhance our teaching. We hoped that Discovery Bags (our version of literacy bags) would be an effective and engaging way to bridge the home-school connection. We created our own homework bags that were designed to introduce and reinforce literacy and mathematics concepts.



This Discovery Bag introduced the children to the concept of division.

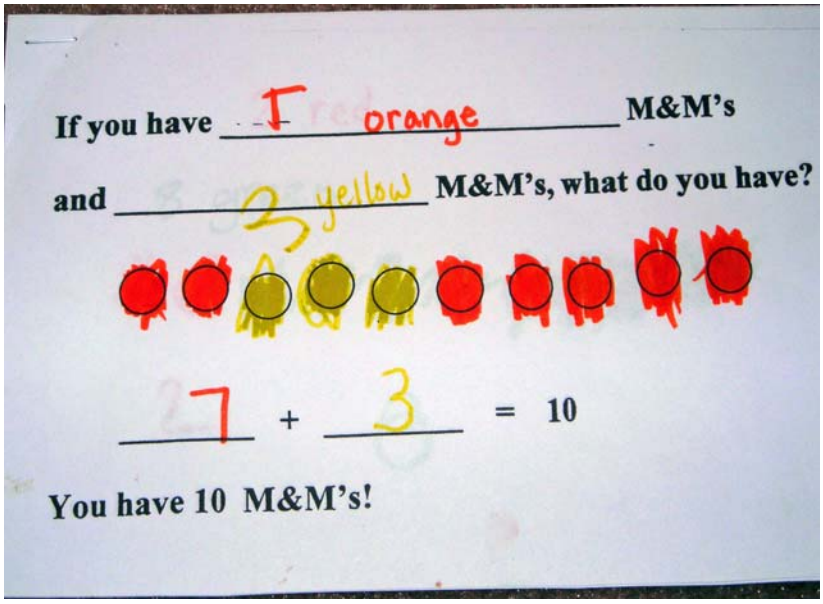
Twelve Discovery Bags were created to include literacy books that supported *Ohio's Preschool Mathematics & Literacy Standards* (Ohio Department of Education, 2002). Bags included: one or more books aligned with these standards, activity instructions, math manipulatives, and a parent survey. Parents were instructed to complete the hands-on activities with their child once a week. The bags were rotated on a weekly basis, resulting in a three month project. By the end of our study, every student had the opportunity to explore each bag.

Discovery Bag S, for example, contained the book, The Doorbell Rang, by Pat Hutchins (1986). Throughout the book, Ma bakes a dozen chocolate chip cookies for her children to enjoy. Then the door bell rings, again, and again, and again; each time bringing more children to share the cookies. This book is a great tool to introduce young children to the concept of division. Also included in the Discovery Bag were small paper plates and clay cookies. The student and a parent were encouraged to divide the "cookies" as they read the story. After completing the activity, they were encouraged to open a small bag of real cookies and divide them equally among friends and family-- a real life application of the skill.

Participation data were recorded for *all students* on a weekly basis. To get a better understanding of the quality of the participation, we asked parents to complete weekly satisfaction surveys. Examples of the weekly survey questions include:

- Did you find the book supportive of the math concepts?
- Were the instructions clear?
- Did your child enjoy the activity, why or why not?
- Does this activity help you to better understand ways to work with your child?

Parents were asked to return all of the materials each week. We collected parent feedback and student artifacts including student-created books, completed graphs, and pattern collages. To gain further insight on parent reactions, a survey was sent out at the end of the project.

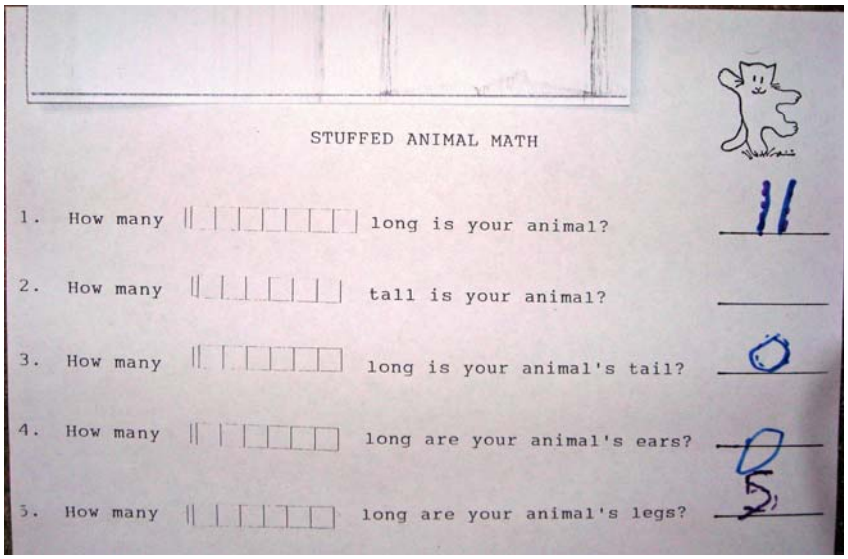


Work sample from Discovery Bag M.

In order to take a closer look at mathematics and reading achievement, ten students were randomly selected for pre and post assessments. This sample consisted of five typically developing peers and five special needs students. To assess literacy development, we administered the *Concepts About Print* test from Marie Clay's Observation Guide (Clay, 2002).

For the mathematics assessment, we devised a rubric based on the mathematics standards. When completing the final math rubric, we analyzed student work samples in order to ensure that we were drawing evidence-based conclusions.

Each item was assessed based on a three point scale: "2" meant *student has mastered the skill* (successfully demonstrated the skill at least 4 out of 5 trials); "1" meant *student's skill is emerging* (successfully completed at least 1 trail); and "0," *skill is not demonstrated*.



One of the work samples from the classroom, used as an assessment tool

Findings

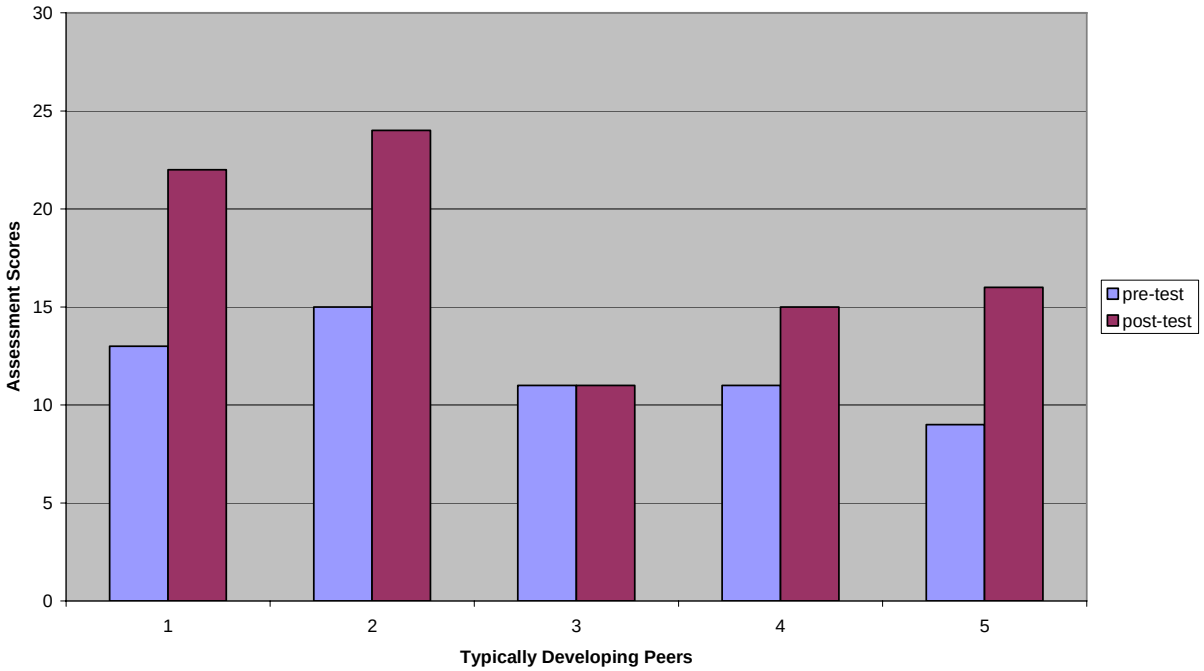
Twenty-two students participated in this study. Nineteen (86%) completed 75% or more of the bags: fourteen students completed all twelve bags, two completed eleven, three completed ten, one completed six, one completed three, and one student only completed one bag.

Feedback on the final parent survey was overwhelmingly positive. Of the twenty-one Summative Surveys sent out, fifteen were returned. While thirteen parents felt that they were comfortable with the preschool standards prior to the bag project, all fifteen parents agreed that the Discovery Bag project gave them a better understanding of the standards. All but one parent understood expectations and assisted/facilitated the activities rather than doing the activities themselves. Only four parents felt that the activities were inappropriate (too easy/hard) for their child. All fifteen parents agreed that the literature book(s) were supportive of the math concepts.

Most parents reported that these activities provided them with ideas of how to incorporate math and literacy into their daily lives.

Eighty-five percent of the parents enjoyed completing the weekly Discovery Bags. The majority of the parents reported that their children were excited to read the books and complete the accompanying math activities. Every parent reported that the experience was positive and led to a better understanding of their child's abilities and how to work with their child. Most parents reported that these activities provided them with ideas of how to incorporate math and literacy into their daily lives. For example, one parent commented, "It made me realize there are lots of ways to incorporate early math concepts into daily life-measuring, classifying/grouping, weighing, adding/subtracting, patterning, etc." Twelve parents noted that they included other family members when completing the

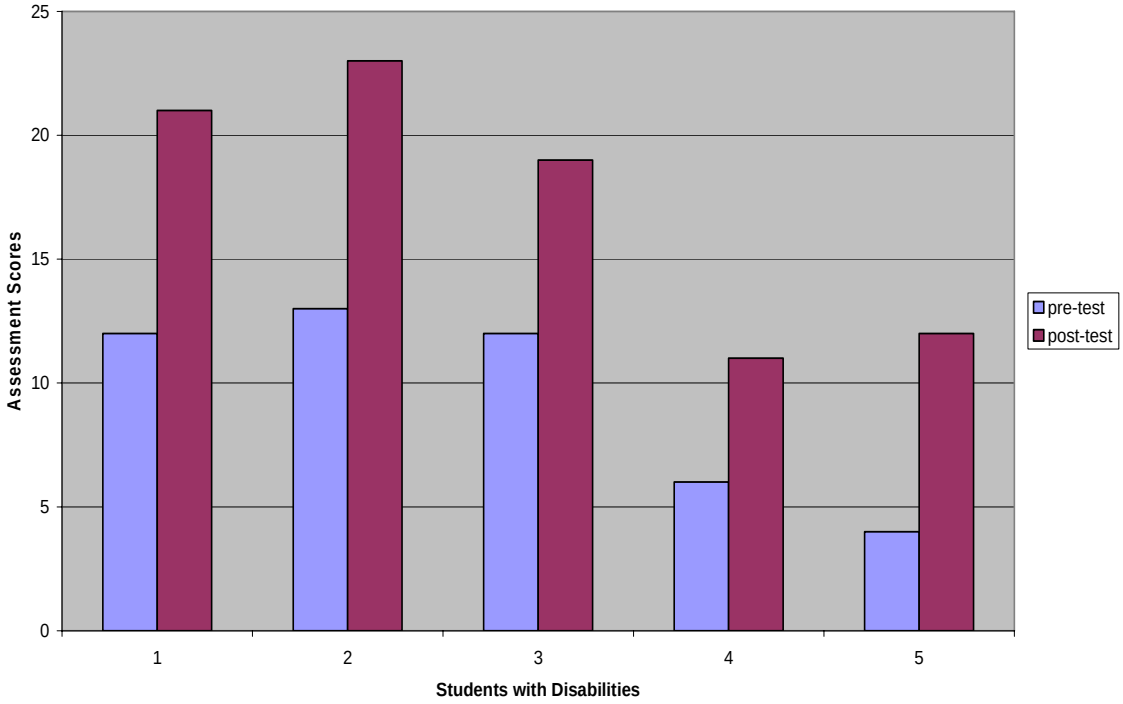
Figure 1
Concepts About Print Pretests and Posttests
Typically Developing Peers



Discovery Bags. Parents reported that their child was exhibiting more pre-reading skills and expressing feelings of accomplishment after completing each bag. These parents also felt that the activities prompted sustained discussion about the mathematics and literacy concepts. Finally, all fifteen respondents agreed that this was a worthwhile project and that these kinds of activities should continue in the future.

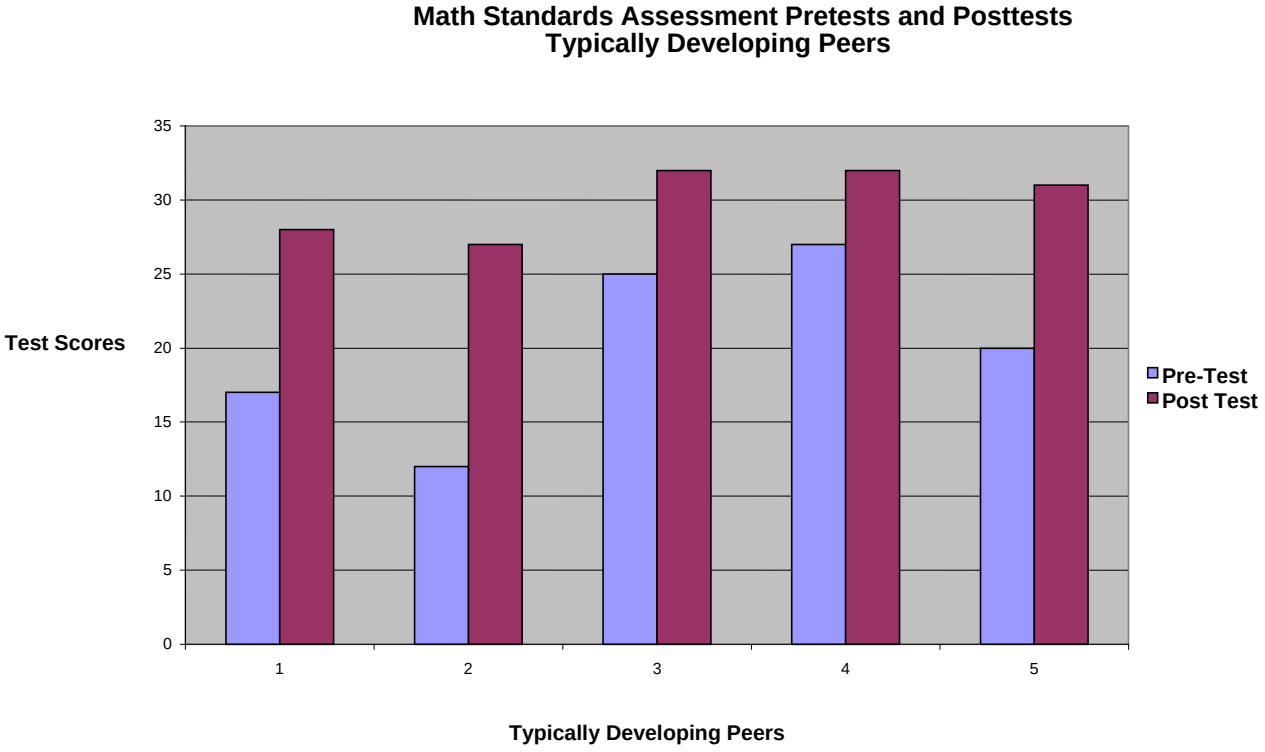
Five special needs and five typically developing peers took the *Concepts About Print* assessment in the Fall (pretest) and Spring (posttest) of the 2006-2007 school year. Scores could range from 0-24. Figure 1 presents the five typically developing peers' scores and Figure 2 presents the results of the five students with disabilities. All ten students made gains on the *Concepts About Print* assessment. The typically developing peers had a pretest average of 11.8 points; their posttest results averaged 17.6 points. The students with disabilities averaged 9.4 points on the pretest. Their posttest average was 17.2 points. On average, the students with disabilities made greater gains than their typically developing peers.

Figure 2
Concepts About Print Pretests and Posttests
Students with Disabilities



The results of the mathematics assessments also showed overall improvement for the ten children. The rating scale had 5 categories: Number/Number Sense/Operations, Measurement, Geometry, Patterns, and Data Analysis. Figures 3 and 4 demonstrate the growth made by each of the ten students in the five areas. It is important to note that the graphs show the number of standards that were *mastered* for each category. The Number/Number Sense/Operations category contained fifteen standards, Measurement consisted of six standards, Geometry included five standards, and Pattern and Data Analysis categories each contained only three standards.

Figure 3



In the Number/ Number Sense/Operation category, the typically developing peers gained an average of 6.2, while the students with disabilities had an average gain of 5.6 out of 15 standards. In Measurement, both groups of students gained 1.8 standards. The students with disabilities had an average growth of 1.8 standards in Geometry, while the typically developing peers had an average gain of 1.0 mastered standard. Positive gains were seen in the Patterns category as well; typically developing peers averaged a gain of 0.6, and students with disabilities an average of 1.4. The area with the least growth was Data Analysis. Both groups mastered less than one-half of a standard more than they had on the pretest. Again, Data Analysis and Patterns only contained three standards; therefore there was not a lot of room for growth. Figure 5 shows the rate of change by category for typically developing peers and students with disabilities. We thought it was interesting that the pattern of growth was very similar for both special needs and typically developing children. The students with disabilities made slightly more progress, but that could be due to the fact that they had more room to improve since they (generally) started lower than did their typically developing peers.

Figure 4

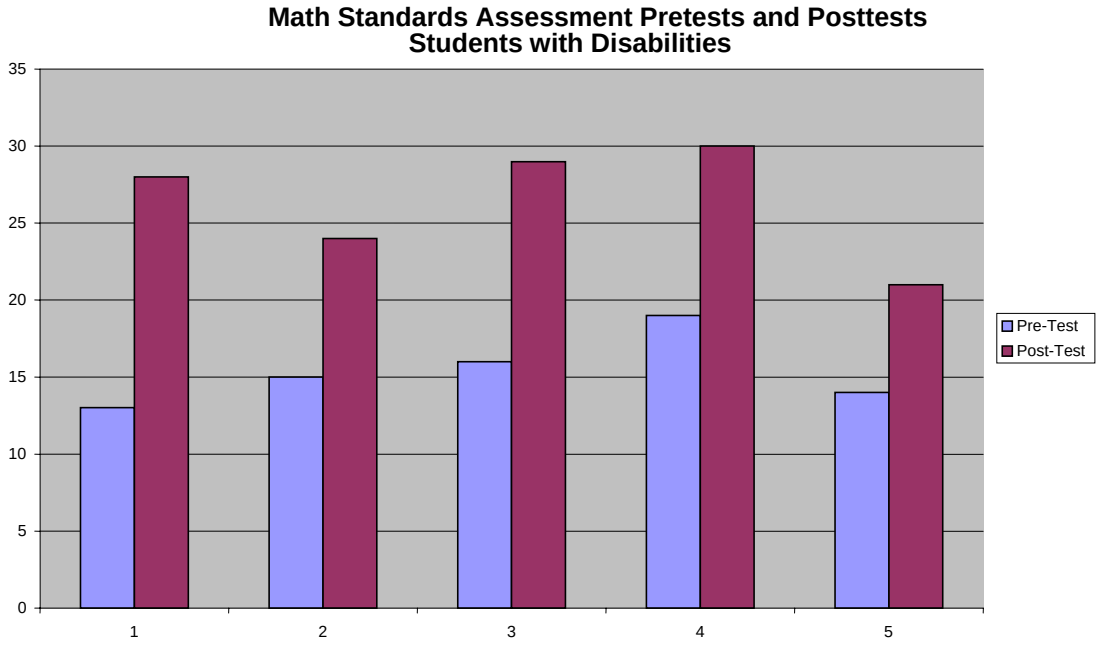
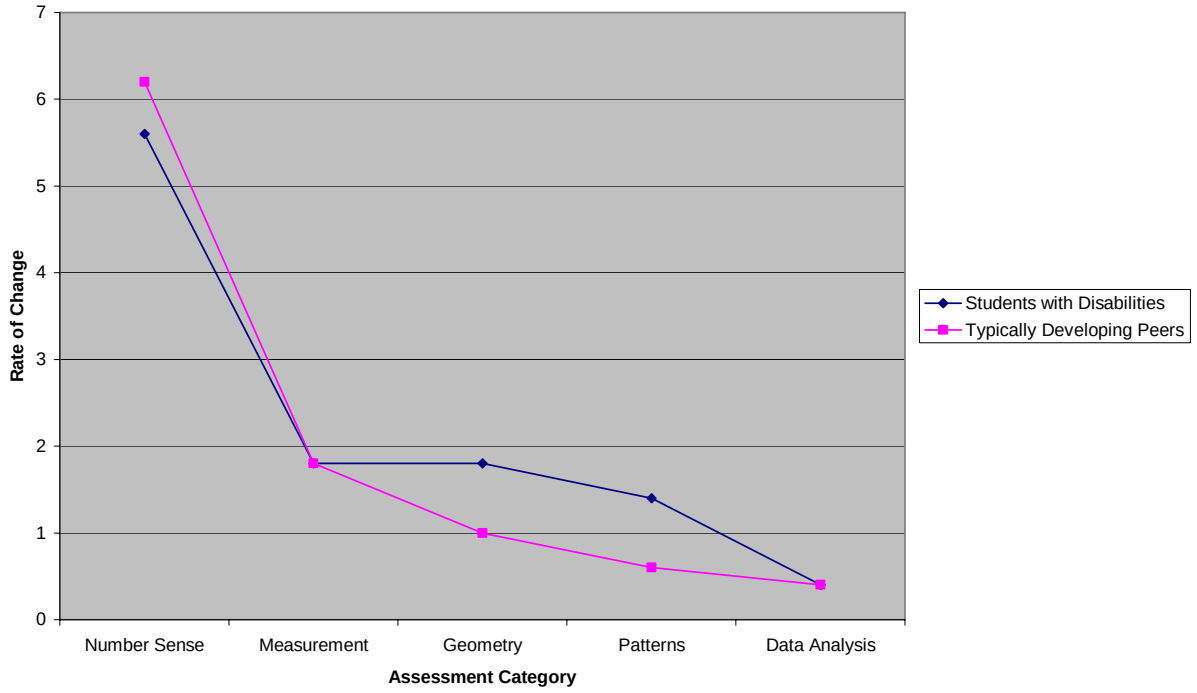


Figure 5
Average Change by Category



Reflections

Parental support for the project was overwhelming. We have not only gained valuable insight into our teaching and individual students, but we also have had the opportunity to strengthen our home-school relationships. The results were very encouraging. However, not all of our parents followed through with the Discovery Bags. While they had agreed to be a part of the project, some parents stopped participating. It was evident that there were parents who wanted to help their child but became frustrated because they did not believe that they had the skills necessary to teach the concepts. In the future we think it would be beneficial to give the parents direct instruction on how to "teach" the bags. As educators we need to hold a workshop and model how to break down (or individualize) lessons for specific children.

As we analyzed our data, we noticed that most students demonstrated some of the literacy and mathematics skills we were targeting with the Discovery Bags on the pretests. It appeared that students possessed some prior knowledge. It is important to point out that a majority of our students attend preschool for two or three years; therefore many of the students have been exposed to these standards and concepts repeatedly. It is also important to note that the pretest was given in early November after students had received instruction for over two months. We want to remind our readers that we did base the Discovery Bags on state-mandated literacy and mathematics standards; therefore we complete similar activities in the classroom as part of our regular curriculum. We also recognize that other factors such as student age and maturity could have impacted our results. We began this project in the fall quarter and completed it spring quarter. Young children make dramatic growth over a period of one academic year.

Although school greatly influences a child's development, it is important to remember that parents provide their children with their educational foundation. Extending a child's knowledge comes naturally for most parents even if they have never heard of developmental theories. Parents can support their child's literacy development by sharing books, drawing and writing together, reading environmental print, and engaging their child in oral language routines. A child's constant curiosity for math-related concepts also allows parents to put these skills into action in the home. For example, when a parent does laundry a child can "help" by sorting the socks by color or size. Through simple exposure the child learns to handle more complex mathematical concepts and can be seen counting and/or measuring while helping out with the laundry.

Our Discovery Bags drew upon a child's natural curiosity and love for learning.
As far as parents were concerned, these bags gave them the direction, confidence, and encouragement necessary to be effective teachers for their children. Despite the fact that we cannot claim that this project is the sole reason for the positive results in our classrooms, we are still sold on the idea of using Discovery Bags as a vehicle for establishing home-school connections and as a way to give students one-on-one instruction on critical content and skills.

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