SCHOOL SUCCESS STARTS IN THE EARLY LEARNING YEARS

House Special Committee on All-Day Kindergarten
February 13, 2014
Contents

Research Brief: Best Practices ................................................................. 1
Center on Enhancing Early Learning Outcomes (Ceelo) Info Request .................. 3
Early Learning Effects on Third and Fourth Grade Reading Scores ..................... 7
Fall, 2010 - 3rd and 4th grade Results ..................................................... 10
School Success Flyer .............................................................................. 12
Research Brief: Best Practices

Data were collected on kindergarten classroom practices by asking participating teachers to complete a self-assessment describing the practices they use in their classrooms during the year. The instrument, Kindergarten Teacher Practices (KTP), is based upon an observation instrument, the Assessment of Practices in Early Elementary Classrooms (APEEC) developed by Hemmeter, Maxwell, Ault and Schuster (2001). The KTP describes practices that are or should be seen in kindergarten classrooms. Part A is composed of physical environment items; Part B is composed of items that relate to the social context and instructional context of the classroom.

The 20 items on the KTP frequency part B that should be seen daily (based upon Developmentally Appropriate Practices as defined by Bredekamp and Copple, 1997) were defined as ‘Best Practices’.

Results of the KTP examine the use of Best Practices across the 232 kindergarten classrooms in the study from the perspective of student achievement on the Kansas Early Learning Inventory (KELI).

A specific review of the data examined the impact of Full Day Kindergarten, defined as Kindergarten classes that go the full school day, every day (the same schedule as 1st through 12th). Sixty percent (60.2%) of the teachers who participated in the School Readiness Project taught full day kindergarten.

In general, Best Practices are more frequently seen in full day kindergarten classrooms rather than in kindergartens that are scheduled for half day sessions. Non-daily Best Practices do not have a significant impact on the outcomes of any of the domains. Best Practices have a marginal effect on math and general knowledge if the child is in all-day Kindergarten while BP have a significant positive effect on symbolic development, written language and oral communication whether the child is in all-day Kindergarten or not.

Of the 20 daily Best Practices, full day and half-day teachers appear to be able to easily incorporate at least 10 to 15 daily best practices. Many teachers in full-day, however, are able to incorporate 16-18 daily best practices while teachers in half-day Kindergarten are rarely able to incorporate more than 15. Most teachers who practice high levels of Best Practices (at least 10) include centers in their classrooms.

Certain daily Best Practices are seen much more frequently in full day kindergarten. These are significantly higher in full day kindergarten sessions than in half-day sessions. Included in the table are the percentage of teachers in the different schedules and the percentage of the total number of teachers participating in the project. These best practices are among those that are highly recommended to be practices in quality classrooms by professional early childhood groups. Note that the highest percentage for all teachers using these practices is just under 86 %.

<table>
<thead>
<tr>
<th>Item</th>
<th>% full day</th>
<th>% half day</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Hands-on materials, such as unifix cubes, games, small toys or art materials are provided for the students in multiple subject areas.</td>
<td>81.74</td>
<td>63.16</td>
<td>74.35</td>
</tr>
<tr>
<td>30. Time for children to learn through play exploration or self-instruction is provided.</td>
<td>79.82</td>
<td>52.63</td>
<td>68.95</td>
</tr>
<tr>
<td>31. Multiple grouping methods (e.g. whole group, small group, individual one-on-one, guided discovery) are used when providing instruction.</td>
<td>81.74</td>
<td>67.11</td>
<td>75.92</td>
</tr>
<tr>
<td>44. Students are encouraged to move independently to new activities when finished with a project.</td>
<td>73.91</td>
<td>56.58</td>
<td>67.02</td>
</tr>
<tr>
<td>45. Students are allowed extra-time, if needed, to complete a project task.</td>
<td>93.04</td>
<td>70.67</td>
<td>84.21</td>
</tr>
<tr>
<td>46. Advance notice about upcoming transitions, both in and outside the classroom, are provided to students.</td>
<td>90.43</td>
<td>78.95</td>
<td>85.86</td>
</tr>
</tbody>
</table>
Summary: Using the best practices daily improves student achievement. Daily use of these "Best Practices" is easier to accomplish in full day sessions of kindergarten. These practices require time and include:

1. use of centers;
2. more hands-on materials available;
3. multiple instructional methods;
4. student choice;
5. time to complete tasks and to show learning.

Other practices which were higher in full day schedules, but were not significantly different at the p<.05 level include enhancing language allowing students to express their thoughts and opinions, diversity teaching. The one practice that appears about the same in both full day and half day kindergarten classrooms is the inclusion of students with disabilities: #47: Students with disabilities participate as fully as possible in all classroom activities.
Research comparing the efficacy of Full Day Kindergarten (FDK) to Part Day Kindergarten (PDK) is limited and some is dated, conducted prior to introduction of the Common Core State Standards and measures holding all students accountable for achieving the same standards regardless of time-in-school models. That stated, the preponderance of data suggest that FDK produces more significant academic and social benefits for students than PDK, particularly for disadvantaged students, although the benefits may fade by third or fourth grade. Below are selected state evaluations of FDK.

- **Indiana.** In 2004 the Indiana Association of Public School Superintendents contracted with the Center for Evaluation and Education Policy to conduct a review of national and state research on FDK as policymakers debated the merits of PDK and FDK. The Effects of Full-Day Versus Half-Day Kindergarten: Review and Analysis of National and Indiana Data, [http://www.doe.in.gov/sites/default/files/curriculum/fulldayreport1.pdf](http://www.doe.in.gov/sites/default/files/curriculum/fulldayreport1.pdf), outlined research-based support for the benefits of FDK enrollment followed by a policy brief Short-Lived Gains or Enduring Benefits?: The Long-Term Impact of Full-Day Kindergarten, [http://www.doe.in.gov/sites/default/files/curriculum/pbspring2005fulldaykindergarten1.pdf](http://www.doe.in.gov/sites/default/files/curriculum/pbspring2005fulldaykindergarten1.pdf), (Plucker and Zapf, 2005). These documents reported consistent improvement for student achievement associated with FDK including increased performance on standardized tests, reduced grade retention and reduced special education referrals.

- **Ohio.** In 1984 the Ohio Department of Education initiated several studies to evaluate the effects of various kindergarten schedules (part-day, alternate-day, full-day) relevant to statewide policy making. A series of impact studies were conducted from 1985 through 1991 followed by a study examining district implementation strategies and challenges. A summary report The Impact and Implementation of Full-Day Kindergarten, [http://www.familyimpactseminars.org/s_infs03c01.pdf](http://www.familyimpactseminars.org/s_infs03c01.pdf), concludes “(d)ata from both the retrospective and prospective studies provide remarkably clear evidence that participation in full-day kindergarten is positively related to subsequent school performance. This strong beneficial relationship is evidenced in standardized test performance, grade retentions and Chapter 1 placements, with the effect of participation appearing to last at least to the second grade.”

In addition to the above state-initiated reports, additional research was identified to address the presenting questions or, in the absence of valid research, an analysis of best practice and expert commentary. The following citations were identified by the Northeast and Islands Regional Education Lab and Center on Enhancing Early Learning Outcomes (CEELO):

1. **What research is available on reading proficiency as affected by half-day and full-day kindergarten? What research is available on math proficiency as affected by half-day and full-day kindergarten?**
   
   
   A meta-analysis found that attending full-day (or all-day) kindergarten had a positive association with academic achievement (compared to half-day kindergarten) at the end of the kindergarten year but the association disappeared by third grade.

   
   Based on analysis of data from the Early Child Longitudinal Study-Kindergarten Class of 1998-1999, there are initial benefits for students who attend full-day kindergarten but these differences largely evaporate by third grade. Contrary to claims by some advocates, attending full-day kindergarten is found to have no additional benefit for students in families with income below the poverty threshold.
Based on a nationally representative sample of over 8,000 kindergartners and 500 U.S. public schools that participated in the Early Childhood Longitudinal Study—Kindergarten Cohort, it is shown that children who attend schools that offer full-day programs learn more in literacy and mathematics than their half-day counterparts.


Findings “indicate that children in full-day kindergarten classes make greater gains in both reading and mathematics compared to those in half-day classes …” (p. 67).

Other non-subject specific research


This study indicated a significant positive difference in academic achievement for children in full-day versus half-day kindergarten. Results suggest that students in a small rural community benefited both academically and developmentally from the extended kindergarten experience.


Targeted FDK program increased grade 4 educational attainment, producing statistically and socially significant impacts.

What are the cohesive processes to maximize instruction benefits?

Best practice suggests that additional instructional time in FDK would permit a less hurried pace for teachers to cover and young students to learn the same material expected by state standards as found in PDK. Increased time allows for more instructional approaches to be used such as flexible small groups and individualized attention, as well as allowing specialized services to be delivered without detracting from the general instructional program.


Time Spent on Reading, Mathematics, Social Studies and Science: Sixty-eight percent of full-day classes spent more than an hour per day on reading instruction compared to 37 percent of half-day classes.

Full-day classes were more likely than half-day classes to spend time every day on math (90 and 73 percent, respectively), social studies (30 and 18 percent, respectively) and science (24 and 10 percent, respectively). On the days when mathematics was taught, 81 percent of full-day classes spent more than a half an hour per day on mathematics instruction compared to 52 percent of half-day classes.


Full-day kindergarten teachers were more likely to spend time on skills including “letter recognition, letter-sound match, conventions of print, vocabulary, making predictions based on text, using context clues for comprehension, rhyming words, reading aloud, reading multi-syllable words and alphabetizing” than half-day kindergarten teachers.

- This study found that approximately 85 minutes is spent per day in full-day classrooms in small-group teaching, one-on-one teacher-student interactions and self-initiated activities, significantly more time than was spent on these types of activities in half-day kindergarten classrooms.


- Research-based position statement addressing developmentally appropriate practice, enrollment, assessment, retention and heterogeneous kindergarten settings.

Policy makers need to consider that additional time in a school day does not guarantee classroom quality. More time in mediocre or low quality programs will not necessarily yield additional positive results. Small class size has been associated with improved student achievement and observance of developmentally appropriate practices are generally recommended by early education specialists (NAECS-SDE, 2000). Several studies have also found association between FDK and increased behavioral problems. Cooper et al., 2010. http://rer.sagepub.com/content/80/1/34.short

What does the research say about closing the achievement gap?

Evidence is generally conclusive that FDK provides benefits for all students with the greatest benefits realized initially by at-risk and disadvantaged children. Academic gains in reading and math are most apparent at the end of kindergarten; however, they often fade-out by third or fourth grade. Factors attributed to fade-out include disadvantaged children often attending lower quality elementary schools, lack of access to educational support in the elementary grades, home environment quality and economic status. No study has found PDK programs to produce superior gains for children compared to FDK. Full-day kindergarten enrollment was also shown to help reduce the achievement gap for minority and low socioeconomic status students. The positive outcomes for minority and low socioeconomic status students appeared to be greater than for non-disadvantaged students.


- Review of research identifies studies that indicate that full-day kindergarten can lead to improved academic achievement and may help close the achievement gap. By reducing the need for future retention and remediation, FDK can also lower subsequent schooling costs.


- Did not find significant effects of full-day kindergarten on most academic outcomes and English fluency through second grade for English learners (EL). However, EL students attending full-day kindergarten were 5 percentage points less likely to be retained before second grade and there are differential effects for several outcomes by student and school characteristics.


- Full-day kindergarten was associated with greater growth of reading and math skills from fall until spring of kindergarten. Initial academic benefits diminished soon after kindergarten.


- Comparing scores on state standardized tests for five-year-old children in full- and half-day kindergarten programs in the United States, students of poverty in full-day kindergarten programs achieve significantly higher test scores in both English/Language Arts (+18.6 points) and Mathematics (+25.1 points) than students who participated in half-day kindergarten programs. The significant difference in the scores of the two groups resulted in gains indicating an abatement of the student achievement gap that exists between students of poverty and students who are not impoverished.

- Using data from the ECLS-K, found that both academic and nonacademic school readiness skills at entry to kindergarten were significantly related to eventual reading and mathematics achievement in fifth grade. Attendance in a full-day kindergarten program was negatively associated with attitudes toward learning, self-control and interpersonal skills and was positively related toward internalizing (measured by a scale indicating presence of anxiety, loneliness, low self-esteem and sadness) and externalizing behaviors. Suggests that investments in development of nonacademic school readiness skills may not only raise overall achievement but may also narrow the achievement gap between minority and white students.


- The non-peer-reviewed state report specifically identifies research on the benefits of FDK for disadvantaged children (p.6 -7), stating FDK “has the greatest effect on at-risk children and children from economically disadvantaged homes.”

Additional Resources:

In addition, a thoughtful communication plan is essential to informing the public and policymakers about kindergarten issues. GroundWork Ohio produced Full-Day Kindergarten: Expanding Learning Opportunities (http://www.groundworkohio.org/resources/policybrief_pdf/020109 Full-Day Kindergarten Expanding Learning Opportunities.pdf) a persuasive fact sheet identifying the benefits of FDK based on economic and educational benefits for use with policymakers, families and the media. The Nevada Legislative Council Bureau also prepared a research brief on full-day kindergarten (http://www.leg.state.nv.us/Division/Research/Publications/ResearchBriefs/FullDayKindergarten.pdf 2012) to inform legislators about issues associated with FDK.

Implementation of kindergarten policies into practice presents its own set of issues on the state and local level. The New Jersey Kindergarten Implementation Guidelines (http://www.nj.gov/education/ece/guide/KindergartenGuidelines.pdf) addresses the issue although the state does not currently require FDK.
Early Learning Effects on Third and Fourth Grade Reading Scores

M. Renee' Patrick, Ph.D.  
University of Kansas  
Lifespan Institute, Parsons  
Parsons, Kansas

Gayle M. Stuber, Ph.D.  
Early Childhood, Special Education and Title Services  
Kansas State Department of Education  
Topeka, Kansas

The School Readiness Project has been investigating early learning experiences of children attending public education programs for nearly 8 years. The project initially focused on children's entering level of skill at Kindergarten entry. Current investigations seek to elucidate the connection between early learning experiences during Kindergarten and later Educational outcomes. This current study focuses on children's Kindergarten experiences and third and fourth grade reading scores on state assessments.

An important factor in early education is the educational dosage. For the purposes of this study, dosage is measured using two important components of Kindergarten education, full day Kindergarten (length of time in class or exposure) and instructional practices (number of practices and frequency of use by teachers or intensity).

The Kindergarten Teacher Practices (KTP) tool is a teacher self-report measure that contains 30 classroom instructional practices that have been deemed developmentally appropriate by experts in the field of early childhood education. A total of 211 teachers completed the KTP. Of those 127 reported they taught in full day every day classrooms and 84 reported they taught in half day or full day every other day classrooms. A total of 1115 students attended full day every day Kindergarten and 756 attended half day or full day every other day Kindergarten from those teachers' classrooms. There were 217 students for whom Kindergarten program information was not available for this study.

Teacher's total scores from the 30 KTP items were computed. Scores on each item ranged from 1 to 6 with lower scores indicating rare to no use of a strategy and higher scores indicating daily/more frequent use of a strategy. The highest score obtainable on the KTP is 180. The highest score obtained by the teachers in this study was 178. Scores were then divided into quartiles and teachers were assigned a quartile based ranking. These were, Low, Medium, High and Very High use of Best Teacher Practices.

<table>
<thead>
<tr>
<th>Quartile Score</th>
<th>Number of Teachers at each Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Low 54</td>
</tr>
<tr>
<td></td>
<td>Medium 56</td>
</tr>
<tr>
<td></td>
<td>High 49</td>
</tr>
<tr>
<td></td>
<td>Very High 50</td>
</tr>
<tr>
<td></td>
<td>Total 209</td>
</tr>
<tr>
<td>Missing</td>
<td>System 2</td>
</tr>
<tr>
<td>Total</td>
<td>211</td>
</tr>
</tbody>
</table>

A lasting main effect was not found for full day Kindergarten or high use of developmentally appropriate teacher practices on third and fourth grade reading scores. There was an interaction effect for level of teaching practices on third grade scores. Students in classrooms with teachers falling in the Very High quartile tended to do better than children in classrooms with teachers scoring in the High quartile on third grade reading assessments (p. < .05). However, a significant interaction effect was found for level of teaching practices and full day Kindergarten. Thus, when combined with a full day program, intensive use of developmentally appropriate teaching strategies can have a lasting effect on a child's education.
Early Learning Effects on Third and Fourth Grade Reading Scores

**Full Day**

![Graph showing mean 3rd grade reading scores for different levels of best practices.]

**Half Day**

![Graph showing mean 3rd grade reading scores for different levels of best practices.]

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Early Learning Effects on Third and Fourth Grade Reading Scores

**Full Day**

![Graph showing mean 4th grade reading scores for different levels of best practices in Full Day kindergarten.]

**Half Day**

![Graph showing mean 4th grade reading scores for different levels of best practices in Half Day kindergarten.]

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Fall, 2010 - 3rd and 4th grade Results
Following 2005-06 and 2006-07 Kindergartners

The Kindergarten class of 2005-06 entered third grade in the fall of 2008 and completed their first state assessments in Reading and Mathematics in the spring of 2009. In the spring of 2010, the Kindergarten class of 2006-07 completed third grade Reading and Mathematics state assessments while the Kindergarten class of 2005-06 completed 4th grade state assessments in reading and Mathematics. Using the KIDS numbers assigned during a child’s first year in a public school program, it is now possible to follow these children into the later primary grades and beyond. This is the second year children were followed past their Kindergarten year in order to determine the impact of parental practices, child learning across the Kindergarten year and Teacher practices on their later learning. More complex statistical study will be needed to make any strong inferences, but these analyses give a glimpse into the long term effects of early learning practices in the home and in schools.

Parent/Home practices before Kindergarten: Impact on Reading and Math scores

The most influential activity that parents performed before kindergarten in relation to third and fourth grade scores was to talk with their children about what happened during the day. Parents who talked with their children daily had children who performed better on the third and fourth grade reading and math assessments.

Parents who reported reading daily prior to Kindergarten had children who scored higher on third and fourth grade assessments.

All five home literacy activities are correlated with reading and math scores—the more frequently the parents performed the activities, the better the children did on state assessments in the third and fourth grade years. These activities also positively impacted children’s Kindergarten scores so the impact appears to be maintained across the years. The five activities are:

1. Someone reads to my child in our home.
2. My child and I talk about what happened during the day.
3. My child reads or pretends to read alone and/or to others.
4. Someone takes my child to a museum, library, learning/activity center or zoo.
5. Someone teaches my child a sport or takes my child to a sporting event.

Clearly, parent involvement makes a difference before Kindergarten, in Kindergarten and on through the primary grades. More analyses in upcoming years will allow a more detailed and stronger case to be made for the critical nature of parent involvement in their child’s learning from the early years on.

Kindergarten Entry Skills: impact on Third and Fourth Grade assessment results

- Children who enter Kindergarten with high skills levels, maintain that higher skill level in the third and fourth grade based upon their results on state assessments in comparison to peers who entered with lower skills.
- Children who entered Kindergarten with higher literacy levels maintained that higher level on both third and fourth grade reading assessments.
- For both 3rd grade math and 3rd grade reading scores, the academic scales on the Kansas Early Learning Inventory (KELI) are better predictors of results than the social skills scales.
- Children who entered Kindergarten with lower fall KELI scores had higher change scores—they improved more than the children who entered Kindergarten with higher KELI scores. The children who entered with a higher level of skills maintained that higher level even into third grade.

Although additional study is warranted, it is clear that children who enter Kindergarten with strong school readiness skills are more likely to maintain their Kindergarten success into higher elementary grades—at least into fourth grade, based upon scores on the two state assessments. Additional study is needed to determine the impact of social skills on later learning.
Full Day Kindergarten vs. Half Day Kindergarten, including Best Practices

The impact of a full day Kindergarten schedule, the use of best practices, including the use of centers was not found to have a significant primary impact on third and fourth grade assessment results. However, results from Kindergarten KELI scores showed that children who entered Kindergarten with lower skills improved more in a full day Kindergarten classroom. Children who left Kindergarten with higher levels of skill tended to do better in third and fourth grade assessments. Current analysis indicates that it is the interaction of full day and best practices that appears to impact later learning. More study is clearly needed to determine how this interaction—(full day/half day; best practices)—may continue to enhance learning levels in the later primary school years after the Kindergarten.
School Success Starts in the Early Learning Years

Children who enter Kindergarten with higher skills demonstrate higher scores on third and fourth grade reading assessments. These children:

- Have parents who reported reading to their children on a daily basis in the years before Kindergarten.
- Have parents who talk to them about their daily activities.
- Attended an all-day Kindergarten with a teacher who used a high number of best teaching practices on a daily basis.

The ability of young children to be successful in Kindergarten and in later years depends in large part upon their experiences during the first five years of life. Through the Kansas School Readiness Project, KSDE has collected data on more than 5,000 Kindergarten children and has followed them into 3rd and 4th grades.

Overall results indicate that early learning programs that use best teaching practices promote growth in literacy, numeracy, and social skills for Kindergarten children who attend these programs.

Early Learning Programs make a Difference:

- Children who attend early learning programs such as Four Year Old At-Risk programs, Head Start, and other community preschools have higher literacy and numeracy skills when they enter Kindergarten.
- Children who receive special education in preschool have a higher skill level than those who begin receiving special education in their Kindergarten year.
- Children who are at-risk enter Kindergarten with lower overall skill levels. However, these children do improve their skill levels by participating in a formal preschool experience.
- Children who enter Kindergarten with higher math skills have higher scores in both third and fourth grade reading and math assessments.

Parents and Families make a difference: Children entering Kindergarten whose Parents:

- participated in a parent education program such as Parents as Teachers (PAT) for at least two years have a higher academic skill level;
- talked with their child daily performed better on the third and fourth grade reading and math assessments.

Kindergarten makes a difference:

- All children improve during their Kindergarten year, but the achievement gap between those who come in with lower skills and those who start with higher skills, while narrowing, does not disappear.
- Teachers in full-day Kindergarten classrooms who use a high number of best teaching practices on a daily basis provide children with a strong foundation for later learning and success in school.

For more about the Kansas School Readiness Initiative, contact Dr. Gayle Stuber, Early Childhood Coordinator, KSDE, gstuber@ksde.org or (785) 296-5352.
The mission of the Kansas State Board of Education is to prepare Kansas students for lifelong success through rigorous, quality academic instruction, career training and character development according to each student’s gifts and talents. To accomplish this mission the State Board has identified five goals. They are as follows:

- Provide a flexible delivery system to meet our students’ changing needs.
- Provide an effective educator in every classroom.
- Ensure effective, visionary leaders in every school.
- Promote and encourage best practices for early childhood programs.
- Develop active communication and partnerships with families, communities, business stakeholders, constituents and policy makers.

Adopted Mar. 2013