School districts are forfeiting the benefits gained from full-day kindergarten by not fully investing in an integrated prekindergarten–third grade (PK–3) approach. Research documents the benefits of full-day kindergarten. For instance, researchers have noted that full-day kindergarten

- Leads to higher academic achievement and reduced achievement gaps among students of different economic and racial/ethnic groups.
- Decreases costs by reducing the need for additional academic support in later years.
- Contributes to increased school readiness.
- Promotes children’s social and emotional development (Ackerman, Barnett, & Robin, 2005; Blake, 2008; Minneapolis Foundation, 2006; National Institute of Early Education Research, 2005; National Institute of Early Education, 2008).

To support and continue the growth students experience with full-day kindergarten, school leaders need to recognize the concept of fade out and create a seamless and aligned PK-3 education system.

Literature Review

Awareness of the “Fade Out” Concept—Loss of Gains in the Primary Grades

Fade out occurs when the achievement gains noted in students who have experienced full-day kindergarten diminish as students progress through the primary grades. Researchers contend that the gains students experience from participating in prekindergarten and full-day kindergarten may not be sufficient “to inoculate children against future academic failure” (Kauerz, 2006, p. 1; Shore, 2009, p. 6).
According to Kauerz (2006),

[A]n increasing body of evidence shows that children’s participation in high quality pre-kindergarten (PK) programs helps them begin kindergarten ready to succeed. Similarly, there is growing evidence that children who start kindergarten behind but participate in a full-day kindergarten (FDK) program catch up to their peers by the end one academic year. The bad news is these effects often appear to “fade out” over time. As children move through the primary grades (grades 1, 2, and 3), the progress they made in PK and FDK dissipates and they are, once again, lagging behind other children. (p. 1)

Fade out during elementary school may be the result of a simplistic assumption that the addition of prekindergarten and full-day kindergarten are sufficient for raising student achievement; or it may be the result of teachers cumulatively slowing down primary grade curriculum and pedagogy due to the wide range of entering level student experiences.

Shore (2009) contends,

When achievement drops, it may seem reasonable to localize the problem and target resources with laser-like precision. But history suggests that efforts confined to a single grade do not lead to lasting change. A well-documented case in point: When policymakers have invested in Prekindergarten programs without sustaining quality enhancements throughout the elementary grades, benefits to participants have tended to fade by third grade, if not sooner. This should not be surprising. We do not expect to achieve a healthier population by fortifying only four year-olds’ meals or adding exercise just for fourth graders. We recognize that serious health problems affecting millions of American children arise over time, and are best prevented or addressed over time with sustained, evidence-based policies and programs. And yet, many states and organizations
continue to pin their hopes on educational strategies that target a single year. They do so despite the fact that one year amounts to only seven percent of a typical student’s PreK-12th grade education. (p. 6)

What policymakers and school leaders need to adhere to is a coherent approach to sustaining high-quality programs that reflect current understandings of how children learn in their formative early years.

The Need for a Seamless and Aligned System

It has become increasingly clear that the key to an effective public education system is a solid, integrated PK–3 system. Recent studies note that “…most Prekindergarten, Kindergarten and elementary school teachers work in isolation from one another. They typically undergo widely varying preparation and training, work in different buildings, report to different supervisors, and have few (if any) opportunities to work together. When teachers cooperate across grades levels, however, the links between school years and lessons become more explicit and children are more likely to benefit” (Foundation for Child Development, 2008, p. 13).

Dinkes (2008) contends,

Aligning pre-K curricula with the needs of its students as they progress from prekindergarten to kindergarten and beyond is critical to developing a successful PK–3 model…. Systems must be aligned vertically across grade levels, horizontally across assessments, curriculum, and instruction, and temporally across the course of a child’s learning experience (p. 52).

A Case Study—One District’s Experience

When schools do not create a seamless PK–3 approach, fade out or flattening of achievement gains can result. The following case study outlines one district’s encounter with
fad out after the implementation of full-day kindergarten. Analyzing the district’s actions and thinking can serve as a lesson for others facing the challenges associated with creating an aligned PK-3 system that is focused on sustainable student achievement.

A midsized school district in southern Minnesota faced challenges found in many public schools throughout the United States. They were experiencing (a) an above-state-average number of special education students, (b) an increasing number of English as Second Language (ESL) students, and (c) an increasing number of students qualifying for the federal free and reduced lunch program. Their initial approach to addressing these challenges was to implement a center based, full-day kindergarten program. Their belief was that full-day kindergarten was an effective means of closing the achievement gap associated with the challenges and was a necessary first step in ensuring more of their students would be ready for first grade.

Once the decision to establish a center based, full-day kindergarten program was made, strategic planning began. Proposed actions were aligned with the vision of the district. The district addressed the four dimensions of strategic leadership in planning: structure, relationships, compelling vision, and sustainability (Reeves, 2002, p. 89). Structure and relationships were addressed through the development of networks and collaborative agreements. The district articulated a compelling vision for what full-day kindergarten would do for student achievement. Teachers, parents, and the community at large were excited. Sustainability was addressed by identifying long term funding, moving funding traditionally spent at the secondary level to support funding of full-day kindergarten, and obtaining a federal reading grant.

A center based full-day kindergarten program was successfully implemented in the fall of 2005. As a part of the implementation of full-day kindergarten, the district developed an
assessment plan for comparing and monitoring reading performance of full-day and half-day students through the third grade (see Table 1).

Table 1. Assessment Plan for Comparing and Monitoring Performance of Full-day Students with Half-day Students

<table>
<thead>
<tr>
<th>Phase</th>
<th>Student Assessment Points</th>
<th>Assessments</th>
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</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>First grade</td>
<td>Fall First Grade Gates MacGinitie Reading Assessments</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Second grade</td>
<td>Fall Second Grade Gates MacGinitie Reading Assessments</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Third grade</td>
<td>Minnesota Comprehensive Assessments II (MCA II)</td>
</tr>
</tbody>
</table>

Results of Phase 1 Assessment Plan: Full-day Kindergarten a Success.

The district selected the Gates MacGinitie Reading Assessment to assess academic performance. Data was collected each fall from 2004 to 2008. District-wide data was reported in stanines using both district and national percentages.

The purpose of the Phase 1 analysis was to determine if the collective reading scores were higher among first graders who completed full-day kindergarten (2006, 2007, and 2008) when compared to those who completed half-day kindergarten (2004 and 2005). Based on the reported stanines, percentages and proportions were calculated for the four lowest stanines and the highest five stanines. Statistical significance is reported at $\alpha = .05$ and $\alpha = .01$ for all analyses.
Half-day kindergarten was last offered by the district in 2005. The Gates MacGinitie Reading Assessment scores were used to establish a baseline assessment of reading achievement reported in nine stanines which they used to compare the proportion of students placing in the top five stanines to students placing in the bottom four stanines. In 2004, 58% of 288 students scored in the lowest four stanines (42% in the top five). In 2005, 54% of 311 scored in the lowest four stanines. The combined baseline proportion was 335 of 599 or .559.

Next, proportions were calculated for 2006, 2007, and 2008. These proportions were then compared with the 2004/05 baseline to determine if the proportion of first grade students in the bottom four stanines significantly decreased and the proportion in the top five stanines significantly increased.

The proportion of students in the lowest four stanines for 2006, 2007, and 2008 were .360, .400, and .267 respectively. These proportions were then compared with the 2004/05 baseline percentage, which was .559. A test of significance between proportions was performed. The difference in proportions was converted to a Z score and then significance was determined using a one-tailed hypothesis (Kuzma & Bohnenblust, 2005). The results are as follows:

2004/05 compared with 2006. Z= 6.01, p<.001. Results are significant at α = .05 and α = .01.
2004/05 compared with 2007. Z= 4.73, p<.001. Results are significant at α = .05 and α = .01.
2004/05 compared with 2008. Z= 8.85, p<.001. Results are significant at α = .05 and α = .01.

There is evidence that the proportion of students in the lowest four stanines significantly decreased, and correspondingly the proportion of students in the top five stanines significantly increased after the introduction of full-day kindergarten. Analysis of Phase 1 data indicates that implementation of the full-day kindergarten program resulted in more students entering grade one with increased reading skills. The district shared these results with staff, parents, legislators
and the community at large and, in general, felt the investment in full-day kindergarten resulted in more students entering grade one with increased reading skills.

*Results of Phase 2: Reading Achievement Fades Out.*

Gates MacGinitie Reading Assessment scores from second grade students were analyzed to determine whether students who completed a full-day kindergarten program performed differently than students who completed a half-day kindergarten program. Students who completed the half-day kindergarten program took the second grade reading test in fall 2005. Students who completed the full-day kindergarten program took the second grade reading test in fall 2007 and fall 2008. Statistical significance was determined at $\alpha = .05$ level.

An ANOVA was conducted to determine if there were significant reading test mean differences between the half-day kindergarten students (2005) and the full-day kindergarten students (2007, 2008). There were no significant reading test mean differences among the three groups, $F(2,973) = .03, p = .97$ (see Figure 1) (Bohnenblust, 2009).

*Figure 1. Reading Test Mean Differences between Full-Day and Half-Day Kindergarten Students*
The analysis of the Phase 2 data indicates that the gains made in full-day kindergarten were not maintained in grade one. By the time the students entered grade two there was no difference in reading performance between the students who completed a half-day program and the students who completed a full-day program. The district was left with many unanswered questions: What happened to the gains experienced after students completed the full-day program? What do we do with this information? How do we move forward? Is full-day kindergarten worth the investment?

*Critical Decisions—Determine Fade Out or Growth*

How school leaders approach and think about the data are critical. The implications of the findings in Phase 2 and the district leadership’s response to the findings reflect the contentions noted in the research. If the district approaches the situation from a narrow perspective and analyzes only what occurred in the full-day kindergarten program, the following determination could be made: Full-day kindergarten is not working; the gains fade out by the start of second grade; the money invested in full-day kindergarten is not worthwhile. As Shore (2009) reminds us, one localized strategy will not in itself solve the challenge of raising student achievement. Leaders must approach decision making with consideration of the whole system.

When reading achievement drops, fades out, or flatlines in grade two, school leaders can no longer afford to localize the blame to one program. If the district approaches the situation from a systemic perspective—examining levels of the organization to determine what is working well, questioning what needs to be changed, and analyzing how data can be used in decision making efforts—the likelihood of establishing an aligned system focused on student achievement is heightened. The school leaders of this midsized district need to think about how to address the Phase 2 data systemically. They need to analyze what was done with the full-day kindergarten
program that resulted in students demonstrating significant gains in reading when they entered grade one and expand those practices into the primary grades.

*Critical Decisions – Implement Systemic Thinking*

By examining the Phase 2 results from a system-thinking perspective it becomes evident that significant structural, curricular and instructional changes were made at the kindergarten level, which resulted in increased student achievement in reading. In addition to students spending more time in school, kindergarten teachers were provided ongoing professional development and instructional materials through the *Reading First* program. A common curriculum was identified, and teachers shared student work on a daily basis. All 18 kindergarten teachers had common preparation time every day to meet and review student progress and monitor and adjust their curriculum and instruction based on formative reading assessments. The investments in increased instructional time, planning time, and teacher development, however, stopped at the kindergarten level.

When analyzing decisions from a systemic perspective, it is evident that similar investments were not made with first grade students, teachers, and programming. Curriculum and student outcomes for first grade students remained the same. Teachers did not receive additional training and common planning time. A lesson was learned: there was a need to approach the situation from a systems perspective. The investment in full-day kindergarten was worthwhile, but school leadership had to look beyond one program. The district had invested in pre-kindergarten and kindergarten with curriculum alignment, professional development, and transition planning. Now they needed to expand their investment to the primary grades and work to create a seamless and aligned PK-3 education system.

Conclusion
Preserve the Investment—Ready Primary Grades

Studies illustrate that achievement gaps between poor and non-poor children already exist at kindergarten. The larger the gap at the time children enter school, the harder the gap is to close.

Bjorklund (2005) shares,

By six to eight years of age, children achieve about 90 percent of their mature brain growth. If you were to compare children’s brains at this age, the number and strength of the neural connections from one child to the next might vary by as much as 30 percent. Those differences would be directly related to the kinds of environments the children experienced. Optimal experiences provide benefits that last a lifetime. Lost opportunities and negative experiences are difficult to overcome. Unfortunately, many children do not receive the supports they need to enhance optimal brain development. (as cited in Kostelnik & Grady, 2009, p. 6)

Redefining school readiness as birth to age eight and creating a seamless, aligned PK-3 education system allows schools to build on the successes birth to age five readiness programs are experiencing.

The investment in the early years is essential, and the investment cannot stop at kindergarten. The National Association for Elementary School Principals (NAESP) and Foundation for Child Development (2006) supports the advancement of PK–3 systemic thinking by noting core elements found in successful programs:

- Strong PK–3 alignment,
- Strong principal leadership,
- High-quality, ongoing professional development,
• Strong focus on student achievement and results.

Research conducted by NAESP and the Foundation for Child Development (2006) also shows that “successful principals who ensure these elements work together create an environment of continuous improvement that helps young children come to school ready to learn and achieve in later grades” (p. 2). For one Midwest school district preserving the initial student success observed from full-day kindergarten is a real and immediate challenge. In order to heighten their ability to ensure sustainable student achievement and avoid fade out, the district’s school leaders must diligently invest the same energy and effort into the primary grades that was given to full-day kindergarten. For others, the district’s experiences provide important lessons for the value of systemic thinking. This district and others across the nation need to conscientiously preserve their investment and expand it to the primary grades by creating a seamless and aligned PK-3 education system.
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