

Illinois Evidence Based Funding for Student Success (Illinois EBFM)

Research Summaries Contributing to Current Recommendations

Research evidence is summarized primarily from the most recent published evidence based (EB) reports and recommendations for Vermont and Kentucky by Evidence Based authors Allan Odden and Lawrence O. Picus and also includes identified and relevant Illinois research and best practice recommendations offered by the Illinois School Finance Adequacy Task Force at National-Louis University in Chicago, 2008-2010 and updated by a collaborative 2016 study group of school leaders from Vision 20/20 (IASB, IASBO, IASA, IPA, SCSDD, IARSS) and other stakeholder groups (see Vision 20/20 Advisory Committee and Pillar Committees on page 36 and at http://illinoisvision2020.org/wp-content/files/Policy_Brief_-_6.20.16.pdf)

Odden and Picus reports are available and published at <http://picusodden.com/state-studies> for Arizona, Arkansas, Kentucky, Maine, North Dakota, Ohio, Texas, Vermont, Washington, Wisconsin and Wyoming.

BASIC DEFINITIONS DISCUSSED IN THE RESEARCH:

Prototypical School Size:

To indicate the relative level of resources in schools, the EB model uses prototypical school units of:

- 450 student K-5 elementary schools
- 450 student 6-8 middle schools
- 600 student 9-12 high schools

These prototypical school sizes reflect research on the most effective school sizes, though in reality few schools are exactly the size of the prototypes. As a result, the general EB formulas (e.g. core content teachers, librarians) are designed in a way that they can be proportionately reduced or increased based on how a school's student enrollment compares to the prototypical models.

Effect Size (see page 34):

Effect size is the amount of a standard deviation in higher performance that the program produces for students who participate in the program versus students who do not. An effect size of 1.0 indicates that the average student's performance would move from the 50th to the 83rd percentile. The research field generally recognizes effect sizes greater than 0.25 as significant and greater than 0.50 as substantial.

Average Student Enrollment (ASE):

All the recommendations related to student counts will use enrollment vs attendance. This is necessary to fully allocate resources to school districts to serve their student population. ASE is calculated on a three-year average or the immediate prior year, whichever is greater.

ADEQUATE STAFFING FOR CORE PROGRAMS

1. Full-Day Kindergarten

Recommendation: Full-day kindergarten for all kindergarten students.

Source: Adequacy for Excellence in Kentucky, December 2014, Picus Odden & Associates

Full-day kindergarten, particularly for students from low-income backgrounds, has significant positive effects on student learning in the early elementary grades (Gullo, 2000; Slavin, Karweit & Wasik, 1994). Fusaro's (1997) late 1990s meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs, found an average effect size of +0.773, which is substantial. Children participating in full-day kindergarten programs do better in learning the basic skills of reading, writing and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all (see also Lee, Burkam, Ready, Honigman & Meisels, 2006).

In 2003, using nationally-representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS–K), Denton, West & Walston (2003) showed that children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. Cooper, et al.'s (2010) comprehensive meta-analysis reached similar conclusions, finding the average effect size of students in full-day versus half-day kindergarten to be +0.25. Moreover, a *randomized controlled trial*, the “gold standard” of education research, found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviations (Elicker & Mathur, 1997). As a result of this research, funding full-day kindergarten for 5-year-olds as well as for 4-year-olds is an increasingly common practice among the states (Kauerz, 2005).

Children from all backgrounds can benefit from full-day kindergarten programs, the EB model supports a full-day program for all students, by counting such students as 1.0 in the state formula.

2. **Staffing ratios for K-3 classroom teachers:**
3. **Staffing ratios for 4-12 core classroom/content teachers:**

Recommendation:

- **15 to 1 for grades K-3**
- **25 to 1 for grades 4-12**

Source: Adequacy for Excellence in Kentucky, December 2014, Picus Odden & Associates

Core content teachers are defined as the grade-level classroom teachers in elementary schools and the core content area teachers in middle and high schools. Core content areas subjects include mathematics, science, language arts, social studies, and world language, the latter in middle and high schools.

The Tennessee STAR study, a randomized controlled trial experiment, found that students in kindergarten to grade 3 in the small classes achieved at a significantly higher level than those in regular class sizes, and that the impact was even larger for low income and minority students (Finn, 2002; Finn and Achilles, 1999; Grissmer, 1999; Krueger, 2002; Word, et al., 1990). The same research also showed that a regular class of 24-25 with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and wide spread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

The positive impacts of the small classes in the Tennessee study persisted into middle and high school years, and even the years beyond high school (Finn, Gerger, Achilles & J.B. Zaharias, 2001; Konstantopoulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopoulos, 2001a, 2001b). The longer students were in small classes (i.e., in grades K, 1, 2 and 3) the greater the impact on grade 4-8 achievement. This study concluded that the full treatment – small classes in all of the first four grades – had the greatest short- and long-term impacts (Konstantopoulos and Chung, 2009). Longitudinal research on class size reduction also found that the lasting benefits of small classes can include a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Evidence on the most effective class sizes in grades 4-12 is harder to find. Most of the research on class size reduction has been conducted at the elementary level. The national average class size in middle and high schools is about 25. Nearly all comprehensive school reform models are developed on the basis of a class size of 25, which is the result of general practice and professional judgment (Odden, 1997a; Stringfield, Ross & Smith, 1996).

Finally, in these times when funds for schools are scarce, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Cringos (2011) argue that though the Tennessee STAR study supports the efficacy of small classes, recent research has produced more ambiguous conclusions related to class size. They also note that this more recent research includes class size reductions in grades above K-3 and most of it relies on “natural experiments” rather than randomized controlled trials. Moreover, they conclude, while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and conclude that small class sizes “pay their way.”

4. Specialist Teachers

Recommendation: Resources for specialist teachers be provided in addition to the number of core content teachers, at the following rate:

- 20 percent for elementary teachers
- 20 percent middle school teachers
- 33.3 percent high school teachers

Source: Adequacy for Excellence in Kentucky, December 2014, Picus Odden & Associates

The EB approach defines specialist teachers as all teachers for subject areas not included in core content areas. For example, art, music, physical education, health, and career and technical education. The proposed ratios offer not only an enriched student curriculum, but also allow for all teachers to have planning and prep time.

According to correlational analysis using a national data set of 8th to 12th graders (NELS:88), students who were involved in the arts had greater academic gains than those who were not (Catterall, Chapleau & Iwanaga, 1999). This impact held for low-income children. Students consistently involved in the arts had greater gains in mathematics achievement.

Music students, in a study using the Louisiana state test results, produced higher mean mathematics scores (Baker, 2012). In the NELS:88 study, low-income students involved in theater arts had greater gains in reading, but also had greater self-concept, motivation, empathy, and tolerance. Furthermore, arts education is associated with advanced cognitive capacities that are often associated with career-ready skills, such as being an independent and organized thinker, having the capacity to test ideas, and persisting in tasks individually and as part of a team (Burton, Horowitz & Abeles, 1999). Cognitive psychologists suggest that arts integration can have a positive impact on knowledge retention, which positively influences motivation (Rinne, Gregory, Yarmolinskaya & Hardiman, 2011).

A review published by the Centers for Disease Control (CDC, 2012) found positive relationships between physical education and academic achievement. This review consisted of 50 studies of varying methodologies with no particular weight on methods.

Arguments about the value of CTE tend to rely on the research examining the relationship between relevance (or authentic intellectual work) and academic achievement. The work of Woolley, Rose, Orthner, Akos, and Jones-Sanpei (2013) uses that relationship as the foundation for their 3-year study of career relevant (pre-occupational) instruction in the middle grades, where such instruction had a positive impact on mathematics performance but not on reading performance. At the high school level, while CTE concentrators tended to take fewer core science courses and score lower on the 12th grade National Assessment of Educational Progress (NAEP), “concentrators in agriculture, business finance, communications and design, computer and information science, and engineering technology score[ed] higher than or not measurably different from non-concentrators” (Levesque, Wun & Green, 2010), which suggests the need to look more closely both at the students who choose these fields but also at the content of the concentrations as they may be contributing to better outcomes.

5. Instructional Facilitators/Coaches

Recommendation: 1 instructional coach position for every 200 students.

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Source: Adequacy for Excellence in Kentucky, December 2014, Picus Odden & Associates

Coaches, or instructional facilitators, coordinate the instructional program but most importantly provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to change and improve their instructional practice (Cornett & Knight, 2008; Crow, 2011; Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means that they spend the bulk of their time with teachers, modeling lessons, giving feedback to teachers, working with teacher collaborative teams, and generally helping to improve the instructional program.

Early research found strong effect sizes for coaches as part of professional development (Joyce & Calhoun, 1996; Joyce & Showers, 2002). A 2010 evaluation of a Florida program that provided reading coaches for middle schools found positive impacts on student performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision making initiative also improved both teachers’ instructional practice and student achievement (Marsh, McCombs & Martorell, 2010). More importantly, a recent randomized control trial of coaching (Pianta, Allen & King, 2011) found significant, positive impacts in the form of student achievement gains across four subject areas – mathematics, science, history, and language arts.

Most comprehensive school designs (see Odden, 1997; Stringfield, Ross & Smith, 1996), and EB studies conducted in other states – Arizona, Arkansas, Kentucky, North Dakota, Wyoming, Washington and Wisconsin – call for school-based instructional facilitators or instructional coaches (sometimes called mentors, site coaches, curriculum specialists, or lead teachers). These individuals coordinate the instructional program but most importantly provide the critical

ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to improve their instructional practice (Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means that they spend the bulk of their time in classrooms, modeling lessons, giving feedback to teachers, and helping improve the instructional program. Instructional coaches also work with collaborative teams helping them analyze student data and its implications for instruction and interventions.

Although instructional coaching positions are identified as FTE positions, schools could divide the responsibilities across several individual teachers. For example, the 3.0 positions in a 600-student high school could be structured with six half-time teachers and instructional coaches. In this example, each teacher/coach would work 50 percent time as a coach – perhaps in one curriculum area such as reading, math, science, social studies or technology – and 50 percent time as a classroom teacher or tutor.

6. Core Tier 2 and 3 Intervention Teachers

Recommendation: 1.0 teacher position in each prototypical school (Additional tutors are enabled through the low income and EL student counts in Element 22)

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Tier 2 and 3 Interventionists, are licensed teachers who, during the regular school day, provide 1-1 or small group (no larger than 5) tutoring to students struggling to meet proficiency in core subjects.

The most powerful and effective approach for helping students struggling to meet state standards is individual one-to-one or small group (1-3 or 1-5 maximum) tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). In earlier reports, the EB model allocated tutors to schools on the basis of the number of at-risk students. Since that time, it has recognized that all schools, even with no at-risk students, have some struggling students and need some minimum Tier 2 resources. Thus, the EB model has been modified so that each prototypical school receives at least one interventionist regardless of the number of at risk students.

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors
- Tutoring initially provided to students on a one-to-one basis
- Tutors trained in specific tutoring strategies
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content-specific scaffolding and modeling
- Sufficient time for tutoring, and

- Highly structured programming, both substantively and organizationally.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though the EB model emphasizes 1-1 tutoring, and some students need 1-1 tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect is often smaller, as it is much more difficult to undo the lasting damage of not learning to read once students enter middle and high schools with severe reading deficiencies. However, a new randomized control study (Cook et al., 2014), discussed below, found similarly positive impacts of a tutoring program for adolescents in high poverty schools IF it was combined with counseling as well. This is made possible by the EB model as it includes such additional non-academic pupil support resources (see Element 23 discussion).

The above rationale for tutors is strengthened by two recent *randomized controlled trials* of the effectiveness of tutoring for struggling students, which support our logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with more need. At the elementary level, using a randomized controlled trial, May et al., (2013) assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found that Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study, and a 0.47 effective size relative to the national population of first grade struggling readers. The effects were similarly large for reading words and reading comprehensive sub-scales.

For students in high schools, Cook, et al. (2014) reported on a *randomized controlled trial* of a two-pronged intervention that provided disadvantaged youth with tutoring *and* counseling. They found that intensive individualized academic extra help – tutoring – combined with non-academic support seeking to teach grade 9 and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy (CBT), led to improved math and reading performance. The study sample consisted mainly of students from low income and minority backgrounds, which generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48; the combined program also appeared to increase high school graduation by 14 percentage points (a 40 percent hike). The authors concluded that this

intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, *randomized controlled trials*, the “gold standard” of research supporting the efficacy of tutoring. Second, they show that tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses only elementary-aged students. Third, they show that tutoring can work even in the most challenging educational environments. And fourth, they bolster the EB argument below that extra help resources in schools triggered by poverty/at risk status should also include some non-academic, counseling resources, as the treatment in the second study was tutoring combined with counseling.

7. Substitute Teachers

Recommendation: 10 days per teacher calculated as 5.7% of a 176 day school schedule (minimum statutory requirement) for core and elective teachers, instructional coaches, tutors (and teacher positions in additional tutoring, extended day, summer school and ESL positions (Assume 33.3% per diem rate)

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

5.7 percent of a minimum student attendance year equals approximately 10 days, so this provision provides up to ten days of substitute teacher resources for each teacher. Illinois statute also requires that each employee of a school district receive 10 sick days.

The EB approach does not mean that each teacher is provided ten substitute days a year; it means the district receives a “pot” of money approximately equal to 10 substitute days per year for all teachers, in order to cover classrooms when teachers are sick for short periods, absent for other reasons, or on long term sick or pregnancy leave. This allocation is not for 10 days above what is currently provided; it simply is an amount of money for substitute teachers estimated at 10 days for each teacher on average. These substitute funds are also meant to provide for student free days for professional development. The professional development recommendations are fully developed in a separate section below (Element 14).

8. Core Guidance Counselors and Nurses

Recommendation:

- 1 guidance counselor for every 450 grade K-5 students
- 1 guidance counselor for every 250 grade 6-12 students
- 1 nurse (CSN) for every 750 K-12 students,
(Additional student support resources are provided on the basis of poverty and EL students in Element 23 below)

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Previous EB models provided student or pupil support resources without specifying guidance counselor or nurse positions. During the past five years, that approach has been changed to provide guidance counselor and nurse positions in the core program, and to provide additional pupil support positions (e.g., social workers and family liaison persons) on the basis of at-risk student counts as described in Element 23 below. Thus, core student support services now specify guidance counselor and nurse positions.

Schools need guidance counselors and nurses. For guidance counselors, the EB model uses the standards from the American School Counselor Association (ASCA). Those standards recommend one counselor for every 250 secondary (middle and high school) students. This produces 1.8 pupil support positions for a 450-student prototypical middle school and 2.4 pupil support positions for a 600-student prototypical high school.

Today, a growing number of elementary schools have begun to employ these personnel. Consequently, the EB model has been modified in recent years to include a minimum of one guidance counselor for a prototypical elementary school.

The physical and medical needs of students also have changed dramatically over the past several years. Many students need medications during the school day; often, school staff are required to administer such medications. Other students have additional medical or physical needs, and our experience in several states is that these needs have been growing over the past decade. Thus, the EB model has been enhanced to provide nurses as core positions. Drawing from the staffing standard of the National Association of School Nurses, the EB model now provides core school nurses at the rate of 1 FTE nurse position for every 750 students.

9. Supervisory Aides

Recommendation:

- **1 aide for every 225 elementary students**
- **1 aide for every 225 MS students**
- **1 aide for every 200 HS students**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Elementary, middle, and high schools need staff for responsibilities that include lunch duty, before and after school playground supervision, sometimes bus duty and other responsibilities that do not require a licensed teacher. Covering these duties generally requires an allocation of supervisory aides at about the rate of 2.0 FTE aide positions for a school of 450 students.

Research does not support the use of instructional aides for improving student performance. The Tennessee STAR study (described in element 2 above), also produced evidence that instructional

aides in a regular-sized classroom do not add instructional value, i.e., do not positively impact student achievement (Gerber, Finn, Achilles & Boyd-Zaharias, 2001).

At the same time, districts may want to consider a possible use of instructional aides that is supported by research. Two studies have shown how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student reading attainment. Some districts have used Farkas-type tutors for students still struggling in reading in the upper elementary grades. Another study by Miller (2003) showed that such aides could also have an impact on reading achievement if used to provide individual tutoring to struggling students in the first grade.

We note that neither of these studies supports the typical use of instructional aides as general teacher helpers. Evidence shows that instructional aides can have an impact, but only if they are selected according to educational criteria, trained in a specific tutoring program, deployed to provide tutoring to struggling students, and closely supervised.

10. Librarians

Recommendation:

- **1 librarian position for each prototypical school**
- **1 librarian assistant/media tech for every 300 students**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

There is scant research on the impact of libraries on student achievement, but in 2003 six states conducted studies of the impacts of libraries on student achievement: Florida, Minnesota, Michigan, Missouri, New Mexico, and North Carolina. And, in 2012 Colorado conducted a statewide study using data from 2005-2011. The general finding is that children with access to endorsed librarians working full time perform better on state reading assessments regardless of income level (Rodney, M.J., Lance, K.C. & Hamilton-Rennell, C, 2003; Lance, K.C. & Hofschire, L, 2012).

The Michigan study found that regardless of whether the librarian was endorsed, student achievement was better for low-income children, but having an endorsed librarian was associated with higher achievement than having an unendorsed librarian (Rodney, M.J., Lance, K.C. & Hamilton-Rennell, C, 2003). Each state examined the issue differently, but library staffing and the number of operating hours were generally associated with higher academic outcomes.

11. Principal/Assistant Principal

Recommendation:

- **1 principal per prototypical school**
- **1 assistant principal per prototypical school**

Source: October 2016, Jason Leahy, IPA Executive Director

Research has made it abundantly clear school leadership is second only to teaching among school-related influences on student success (Leithwood, Louis, Anderson, & Wahlstrom, 2004; Marzano, Waters, & McNulty, 2003; Supovitz & Poglinco, 2001). According to a 2015 Wallace Foundation report authored by Paul Manna, principals:

- Have the greatest impact on schools with the greatest needs,
- Strongly shape the conditions for high-quality teaching and learning, and
- Are the prime factor in determining whether teachers stay in high-needs schools.

Essentially, effective schools are led by principals who are effective leaders (Goldring, Porter, Murphy, Elliott, & Cravens, 2009).

Illinois has long recognized the importance of principal leadership passing several pieces of legislation intent on improving principal effectiveness. PA 94-1039, passed in 2006, established a statewide mentoring program for first year principals (state funding dependent). Public Act 96-0373, passed in 2009, allowed for a second year of mentoring for new principals (state funding dependent). PA 96-0903, passed in 2010, initiated the redesign and re-accreditation of all principal preparation programs in Illinois. Most recently, PA 96-0861, passed in 2010 and better known as the Performance Evaluation Reform Act (PERA), called for the redesign of principal evaluation systems in every Illinois public school district. Specifically, PERA required principal evaluation systems to incorporate both standards based leadership practices and student growth measures to be included as assessments of principal effectiveness.

Obviously, every school unit needs a principal. In addition to what was already referenced, there is abundant evidence detailing the impact of high quality instructional leadership in schools. Suffice to say that all comprehensive school designs, and all prototypical school designs from all professional judgment studies around the country, include a principal for every school unit. Furthermore, recent education reforms including new teacher evaluation systems, new learning standards, and new student management requirements have caused many school systems in Illinois to also provide assistant principals to schools with 450 or fewer students at all levels. This implies that one principal and an assistant principal would be required for each prototypical school unit. This was confirmed as an emerging and appropriate recommendation by the National Louis Finance Adequacy Task Force. Murphy (2016) provides a good overview of the key roles principals and assistant principals play in organizing schools to boost student learning.

12. School Site Secretarial Staff

Recommendation:

- 1 secretary position for every 225 elementary students
- 1 secretary position for every 225 middle school students
- 1 secretary position for every 200 high school students

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

The secretarial ratios included in the EB model generally are derived from common practices across the country and verified by the National Louis Finance Adequacy Task Force. There is no research on the impact that clerical staff have on student outcomes, yet it is impossible to have a school operate without adequate clerical staff support.

DOLLAR PER STUDENT ALLOCATIONS

In every school district, there are needed elements where the greatest evidence available is based on research that leads to a per pupil allocation based on current or best practices. The National Louis Finance Adequacy Task Force and more currently, a collaborative comprised of leading Illinois educational experts verified allocation rates for these particular elements.

13. Gifted and Talented Students

Recommendation: \$40 per student.

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Source: Illinois 2015 Annual Financial Reports

A complete analysis of educational adequacy should include gifted and talented students, most of whom perform above state proficiency standards. This is important for all states whose citizens desire improved performance for students at all levels of achievement.

Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low income and/or culturally diverse students
- Curriculum materials designed specifically to meet the needs of talented learners
- Acceleration of the curriculum
- Special training in how teachers can work effectively with talented learners

Research studies on the use of performance assessments, nonverbal measures, open-ended tasks, extended try-out and transitional periods, and inclusive definitions and policies show that these produce increased and more equitable identification practices for high-ability culturally diverse and/or low-income learners. Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, high-ability, culturally-diverse learners who participated in three or more years of specialized elementary and/or middle school programming, had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high-ability students who did not participate (Struck, 2003).

To implement additional practice implications, the University of Connecticut center developed a very powerful Internet-based platform, Renzulli Learning, which provides for a wide range of programs and services for gifted and talented students. Renzulli stated that such an approach was undoubtedly the future for the very bright student and could be supported by a grant of \$25 per student in 2005. National Louis Finance Adequacy Task Force confirmed that rate as best practice in Illinois in 2008, but more recently a study of current school district expenses in Illinois found gifted interventions costing \$40 per pupil.

14. Professional Development

Recommendation: \$125 per student for trainers in addition to instructional coaches (Element 5) and provides time for collaborative work.

Source: Adequacy for Excellence in Kentucky, December 2014, Picus Odden & Associates

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

All school faculties need ongoing professional development, especially today with the challenge of implementing the Common Core Standards and preparing all students to be college and career ready. Improving teacher effectiveness through high quality professional development is arguably as important as all of the other resource strategies identified. Effective teachers are the most influential individual school-based factor in student learning (Rowan, Correnti & Miller, 2002; Wright, Horn & Sanders, 1997) and a more systemic and uniform deployment of effective instruction is key to improving learning and reducing achievement gaps (Odden, 2011a; Raudenbusch, 2009).

There is recent and substantial research on effective professional development and its costs (e.g., Crow, 2011; Odden, 2011b). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles researchers and professional development organizations use to characterize "high quality" or "effective" professional development draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. Combined, these studies and recent reports from Learning Forward, a national

organization focused on professional development (see Crow, 2011), identified six structural features of effective professional development: form, duration, collective participation, content focus, active learning, and coherence.

It should be clear that the longer the duration, and the more the coaching, the more time is required of teachers as well as professional development trainers and coaches.

Note that there is little support in this research for the development of individually oriented professional development plans; the research implies a much more systemic approach.

Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year as well. This time costs money.

Further, all professional development strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to comprehensively describe specific professional development programs and their related resource needs.

15. Instructional Materials

Recommendation: \$190 per student for instructional and library materials

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Source: Illinois 2015 Annual Financial Reports

The need for up-to-date instructional materials is paramount. Newer materials contain more accurate information and incorporate the most contemporary pedagogical approaches. New curriculum materials are critical today as school systems shift to more rigorous college and career ready standards. To ensure that materials are current, twenty states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Ravitch, 2004). Up-to-date instructional materials are expensive, but vital to the learning process. Researchers estimate that up to 90 percent of classroom activities are driven by textbooks and textbook content (Ravitch, 2004). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely.

With more rigorous curriculum standards as a backdrop, the current EB recommendation is to create one unified rate of instructional materials per ASE regardless of whether the student is an elementary or secondary school student. A recent study of Illinois funding for this area finds that a rate of \$170 per student currently supports the purchase of instructional materials that are organized to take advantage of Illinois teaching strategies. This funding level would also allow the purchase of digital access to some textbooks if districts desire to adopt and experiment with digital access to textbook materials. If combined with a regular adoption cycle, this annual

allocation will allow districts to focus on purchasing new curricular materials for one subject area a year, including textbooks and supplementary materials, all of which are needed to enable teachers to raise student achievement.

For libraries, the EB recommendation includes funding of \$20 per student to pay for library texts and ever expanding electronic services. These figures modestly exceed the national average, allowing librarians to strengthen print collections. At the same time, it allows schools to provide, and experiment with, the electronic database resources on which students rely (Tenopir, 2003).

Adding this \$20 per student figure to the \$170 per student figure for instructional materials, brings the current EB recommendation to \$190 per student for instructional and library materials and is verified by current spending levels in Illinois schools.

16. Assessment

Recommendation: \$25 per student for local assessments

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Source: Illinois 2015 Annual Financial Reports

These include benchmark, progress monitoring, formative, diagnostic and other assessments teachers need in addition to state accountability assessment data.

Data-based decision-making has become an important element in school reform over the past decade. It began with the seminal work of Black and William (1998) on how ongoing data on student performance could be used by teachers to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour, et al., 2010; Steiny, 2009). The goal is to have teachers use data to inform their instructional practice, identify students who need interventions and improve student performance (Boudett, City & Murnane, 2007). As a result, data-based decision-making has become a central element of schools that are moving the student achievement needle (Odden, 2009, 2012).

Recent research on data-based decision-making has documented significant positive impacts on student learning. For example, Marsh, McCombs and Martorell (2010) showed how data-driven decision-making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a recent study of such efforts using the gold standard of research – a *randomized controlled trial* – showed that engaging in data-based decision-making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman & Robinson, 2011).

The most recent EB studies recommend \$25 per pupil and indicate that it offers districts an array of choices for different types of student monitoring at different costs. Examples of tests include, but are not limited to: MAP - \$13.50 per student, DIBELS - \$1 per student, AIMSWEB - \$6 per

student, STAR - \$11.45 per student. Further, \$25 is the current annual expense per pupil for assessments in Illinois schools.

For more information about benchmark assessments, Hanover Research⁶ recently completed an extensive review of the above and other interim assessment systems, including costs and ratings of them from the National Center for Response to Intervention.

17. Computer Technology and Equipment

Recommendation: \$571 per student for school computer & technology equipment (based on 1:1 program cost)

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Source: Illinois 2015 Annual Financial Reports

These include within school technology - computers, servers, network equipment, copiers, printers, instructional software, security software, curriculum management courseware, etc.

Over time, schools need to embed technology in instructional programs and school management strategies. Today, more and more states require students not only to be technologically proficient but also to take some courses online in order to graduate from high school. Further, there are many online education options, from state-run virtual schools such as those in Florida and Wisconsin, to those created by private sector companies who run many virtual charter schools. “Blended instructional” or “the flipped classroom” models, such as Rocketship, have also emerged (Whitmire, 2014). These programs infuse technology and online teaching into regular schools, provide more 1-1-student assistance, and put the teacher into more of a coaching role (see Odden, 2012). Research also shows that these technology systems work very well for many students, and can work very effectively in schools with high concentrations of lower income and minority students (Whitmire, 2014).

The EB Model assumes that no Illinois school is beginning at a baseline of zero. All Illinois schools have a variety of computers of varying ages. Most schools have been wired and many are now adding Wi-Fi capabilities and increasing bandwidth. The EB Model assumes major capital expenses such as access to fiber optics have, or will be covered, with other capital funds.

The cost analysis does include funds for upgrading network switchgear and central servers that occur in the normal course of maintenance.

We refer readers to more detailed analysis of the costs of equipping schools with ongoing technology materials (Odden, 2012) that was spearheaded by Scott Price, now Chief Financial Officer for the Los Angeles County Office of Education. The analysis estimated four categories of technology costs totaling \$250 a student for a 1:3 program and \$571 for a 1:1 program. The

amounts by category should be considered flexible, as districts and schools need to allocate dollars to their highest technology priority outlined in state and district technology plans.

The per-student costs for each of the four subcategories for both a 1:3 and 1:1 program are:

- Computer hardware: \$71/\$213
- Operating systems, productivity and non-instructional software: \$72/\$110
- Network equipment, printers and copiers: \$55/\$144
- Instructional software and additional classroom hardware: \$52/\$104

This per student figure is sufficient for schools to purchase, upgrade and maintain computers, servers, operating systems and productivity software, network equipment, and student administrative system and financial systems software, as well as other equipment such as copiers. System software packages vary dramatically in price; the figure recommended would cover medium priced student administrative and financial systems software packages.

The EB recommendation is typically focused on a 1:3 ratio, but the studies and best practices recommended by the Illinois collaborative that updated the National Louis University Finance Adequacy Task Force analysis recommend a 1:1 program.

Advocates of one-to-one computing cite various benefits, including: improved student achievement (especially in writing skills), increased student engagement and collaboration, better implementation of project-based learning, an expansion of learning beyond the classroom, and instant access to information. Opponents claim it is difficult to isolate technology as the only contributing factor to these benefits. Other drawbacks mentioned include: the cost, need for increased student supervision, and the necessity to provide additional professional development to teachers and other district staff (Sauers & Mcleod, 2012; Jackson, 2009; Goodwin, 2011).

One of most important benefits of implementing a one-to-one program consists of extending the learning environment beyond the school day to the home. However, unless Internet access is ensured at a student's home and teachers use technology to change their strategies to take advantage of this access, then this benefit will be left unrealized.

One of the clear advantages of a one-to-one program is students collaborate more in off-hours on projects. This increases the frequency with which they practice writing and communicating in written and other forms. Once again this depends on the Internet access in the home.

Successful one-to-one programs are driven by district/school leader advocates for these programs (Oliver, 2012). These programs demand a high level of coordination between the instructional and business sides of the school district. They require board and community support. 1:1 programs are becoming an expectation when there is a strong commitment to 21st Century Learning, a key pillar of Illinois Vision 20/20.

18. Extra Duty and Student Activities Stipends

Recommendation:

- **Elem: \$100 per student**
- **MS: \$200 per student**
- **HS: \$675 per student**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Source: Illinois 2015 Annual Financial Reports

Elementary, middle, and high schools typically provide an array of non-credit producing after-school programs, from clubs and bands, to sports and other activities. Teachers supervising or coaching these activities usually receive small stipends for these extra duties.

Research shows, particularly at the secondary level, that students engaged in student activities tend to perform better academically than students not so engaged (Feldman & Matjasko, 2005), although too much extra-curricular activity can be a detriment to academic learning (Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1996, 1997). Feldman and Matjasko (2005) found that participation in interscholastic (as compared to intramural) sports had a positive impact for both boys and girls on grades, post-secondary education aspirations, reducing drop-out rates, lowering alcohol and substance abuse, and led to more years of schooling. The effect was particularly strong for boys participating in interscholastic football and basketball. One reason for these impacts is that participation in interscholastic athletics placed students in new social groups that tended to have higher scholastic aspirations and those aspirations "rubbed off" on everyone. But the effects differed by race and gender, and were not as strong for African Americans.

The recommendation made here by the collaborative that updated the National Louis Adequacy Task Force work is based on the actual allocations in Illinois schools in 2015.

CENTRAL OFFICE FUNCTIONS

19. Maintenance and Operations

Recommendation: \$1,038 per student (33.57% or \$348 is the salary component that applies to element 21 - Employee Benefits)

Source: Illinois 2015 Annual Financial Reports

This element covers functions such as custodial services, grounds maintenance and facilities maintenance, and minor repairs. Includes salary, supplies and materials as well as purchased services. Excludes employee benefits.

The recommendation is based on the 2015 average expense per district in Illinois. An additional recommendation is for a Professional Judgement Panel to examine the opportunity to develop a more standardized approach to maintenance and operation funding and the related data collection that would be necessary to add a funding methodology to the Illinois EB.

20. Central Office Operations

Recommendation: \$742 per student (49.04% or \$364 is the salary component that applies to element 21 - Employee Benefits)

Source: Illinois 2015 Annual Financial Reports

This element includes resources for central office staff including administrators and classified personnel charged with managing the instructional programs and business/operations of the school district. Includes salary, supplies and materials, telephone, software, computers, as well as purchased services (e.g. auditors, legal services, financial advisory services, etc). Excludes employee benefits.

The recommendation is based on the 2015 average expense per district in Illinois. An additional recommendation is for a Professional Judgement Panel to examine the opportunity to develop a more standardized approach to central office operations funding and the related data collection that would be necessary to add a funding methodology to the Illinois EB.

21. Employee Benefits

Recommendation: 30% of total payroll + any additional employer pension normal cost shift

Source: Illinois 2015 Annual Financial Reports

This element includes health, dental and vision insurance typically offered to all employees. Also includes any costs associated with payment of normal cost for teacher pensions. Also includes SS or IMRF contributions for non-licensed personnel.

The recommendation is based on the 2015 average expense per district in Illinois. An additional recommendation is for a Professional Judgement Panel to examine the opportunity to update employee benefit funding and the related especially to the growing cost of implementing the Affordable Care Act. Since this is a large expense in every district it will be necessary to maintain a current funding allocation in the Illinois EB.

RESOURCES FOR DIVERSE LEARNERS

Because not all students will meet standards with just the core instructional program, districts and schools need a powerful sequence of additional and effective strategies for students that

require additional support. The EB approach identifies a series of specific, supplementary programs for diverse learners including:

- Tutoring to provide immediate, intensive assistance to keep diverse students on track
- Extended day programs to provide more time on task for diverse students
- Summer school to provide more instructional time for diverse students
- Sheltered English and ESL instruction for Learners (ELs) students
- A “census” approach to funding special education

These programs all extend the learning time for students in focused ways. The key concept is to implement the maxim of standards-based education reform, keep standards high, but vary the instructional time so students can become proficient.

The EB elements for extra help are also embedded in the “response to intervention” (Fuchs, D & Fuchs, L.S., 2006) schema:

- Tier 1 includes the regular instruction provided to all students. The proposals for class size, time for collaborative work during regular school hours and ongoing, systemic professional development are designed to make core instruction as effective as possible.
- Tier 2 includes the staffing for tutoring and other interventions during the regular school day, extended day and summer school, with the tutoring staff covering nearly all possible small group Tier 2 intervention programs.
- Tier 3 includes EL and special education which provides the more intensive extra help services for these special populations.

Illinois currently uses DHS counts (as opposed to *Free and Reduced Priced Lunch* counts) when determining targeted aid. The DHS count is the count of children eligible for at least one of the following low income programs: Medicaid, the Children's Health Insurance Program, TANF, or Food Stamps, excluding pupils who are eligible for services provided by the Department of Children and Family Services.

For tutors, extended day and summer school, the Illinois EBFM model uses a duplicated number of low-income students and EL students as proxies for the number of students who need extra help to achieve to standards in each school. This proxy is used because of the persistent correlation between poverty and low achievement (Gamoran, A. & Long, D.A., 2006) and the rising need for EL services and high proportions of poverty that are associated with EL students (currently 60% in Illinois).

For purposes of allocating resources under the Illinois EBFM, we use the higher of the average number of DHS or EL students for the prior school year or the immediately preceding 3 school years.

The Illinois EBFM approach supports a move toward a blended identification methodology for low income counts and tasks a Professional Judgement Panel to study and recommend an appropriate methodology within 5 years of implementation.

22. Tier 2 and 3 Intervention Teachers

Recommendation in addition to the one core intervention position in each prototypical school:

- **1.0 teacher position for every 125 DHS Poverty Count**
- **1.0 teacher position for every 125 EL students**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

The most powerful and effective extra help strategy to enable struggling students to meet state standards is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels (i.e. students who are EL, low income, or have minor disabilities) especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982).

The impact of tutoring programs depends on how they are staffed and organized, their relation to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors
- Tutoring initially provided to students on a one-to-one basis
- Tutors trained in specific tutoring strategies
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content specific scaffolding and modeling
- Sufficient time for the tutoring
- Highly structured programming, both substantively and organizationally

The above research suggests several specific structural features of effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1-1 tutoring.). Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools.
- Second, most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, close to half the student body of a 450-pupil school unit could receive individual tutoring during the year.

Third, not all students who are from a low-income background require individual tutoring, so a portion of the allocation could be used for students in the school who might not be from a lower income family but nevertheless have a learning issue that could be remedied by tutoring. What has been effective with adolescents is a model combining intensive academic intervention such as tutoring with socio-emotional support with at a ratio of about 1:8 where the adult is a college-educated person but not necessarily a trained teacher. A randomized-control trial conducted by Cook, Dodge, Farkas, Fryer, et al (2014) produced as many as three years of growth in a single year with one-hour daily intervention. Such a study supports the EB at-risk elements, which include both tutoring (an intensive academic intervention) and additional pupil support/counseling staff.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004: 12) states:

Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at-risk children in kindergarten, first grade and second gradeonly the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability ... schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text.... Finally, it requires not only direct practice to build fluency.... but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

One- to-one tutoring works with 20 minutes of tutoring per student for positive effects, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes (Elbaum, Vaughn, Hughes & Moody, 1999, Torgeson 2004). The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, a one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though we have emphasized 1-1 tutoring, and some students need 1-1 tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect, unfortunately, is smaller as it is much more difficult to undo the lasting damage of not learning to read when students enter middle and high schools with severe reading deficiencies.

23. Additional Pupil Support Teachers

Recommendation:

- **1.0 pupil support teacher position (i.e. social worker) for every 125 DHS Poverty Count students**
- **1.0 pupil support teacher position for every 125 EL students.**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Core pupil support positions for guidance counselors and nurses are discussed above in core resources as Element 8. At risk students, however, generally have more non-academic needs that should be addressed by additional pupil support staff, which could include more guidance counselors, as well as social workers, family liaison individuals, and psychologists. Thus, in addition to the core guidance counselor and nurse positions provided to every prototypical school discussed above for Element 8, the EB model provides additional pupil support position at the rate of one for every 125 at low income students and every 125 EL students.

Low income and EL students tend to have more non-academic issues for schools to address. This usually requires interactions with families and parents as well as perhaps more guidance counseling in school. The EB model addresses this by providing more staffing resources to meet these needs. Although there are many ways schools can provide outreach to parents or involve parents in school activities – from fundraisers to governance – research shows that school-sponsored programs that have an impact on achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, such as the new college and career ready standards, programs that help parents and students understand both what needs to be learned and what constitutes acceptable standards for academic performance have been found to improve student outcomes. Parent outreach that explicitly and directly addresses what parents can do to help their children be successful in school, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on students' academic learning (Steinberg, 1997).

At the secondary school level, the goal of parent outreach programs is to have parents learn about what they should expect of their children in terms of academic performance. If either performance on end-of-course examinations or performance on comprehensive high school tests are required for graduation, such as Vermont's proficiency standards for high school graduation, they too should be discussed. Secondary schools need to help parents understand how to more effectively assist their children in identifying an academic pathway through middle and high school, understand standards for acceptable performance, and be aware of the course work

necessary for college entrance. This is particularly important for parents of students in the middle or lower end of the achievement range, as often these students know very little of the requirements for transition from high school to post-secondary education (Kirst & Venezia, 2004).

At the elementary level, parent outreach and involvement programs should concentrate on what parents can do at home to help their children do academic work for school. Too often parent programs focus on fundraising through the parent-teacher organization, involvement in decision-making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities might impact other goals – such as making parents feel more comfortable being at school or involving parents more in some school policies – they have little effect on student academic achievement. Parent actions that impact learning would include: 1) reading to children at young ages, 2) discussing stories and their meanings, 3) engaging in open-ended conversations, 4) setting aside a place where homework can be done, and 5) ensuring that children complete homework assignments.

24. Extended Day Programs

Recommendation:

- **1.0 teacher position for every 120 DHS Poverty Count students and**
- **1.0 teacher position for every 120 EL students.**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

At both elementary and secondary school levels, some struggling students are likely to benefit from after-school or extended-day programs, even if they receive tutoring/Tier 2 interventions during the regular school day. Extended-day programs are created to provide academic support as well as to provide a safe environment for children and adolescents to spend time after the school day ends during the regular school year.

The allocation of staff for extended-day programs is derived through the following process. We assume that extended day programs offer academic support for two hours a day five days a week for low income and EL students. We further assume that half of the eligible students will participate, and classes will be limited to 15 students each. Thus, if there are 120 eligible students, 60 will take advantage of the program, requiring four extended day classes of fifteen students. Teaching two hours a day is approximately 0.25 FTE, and since four classes are required, a total of 1.0 FTE teacher position is needed to serve the 120 eligible students.

In a review of research, Vandell, Pierce and Dadisman (2005) found that well designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (see also Fashola, 1998; Posner & Vandell, 1994). On the other hand, the evaluation of the 21st Century Community Learning Centers (CCLC) Program (James-Burdumy et al., 2005), though hotly debated, indicated that for elementary students, extended-day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce &

Dadisman, 2005) argued that the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. They also argued that the small impacts that were identified had more to do with lack of full program implementation during the initial years than with the strength of the program.

Overall, studies have documented positive effects of extended-day programs on the academic performance of students in select after-school programs (e.g., Takoata & Vandell, 2013; Vandell, 2014). However, the evidence is mixed both because of research methods (few randomized trials), poor program quality and imperfect implementation of the programs studied. Researchers have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program; staff expertise; staff stability/turnover; compensation; institutional supports)
- Program/group size and configuration (enrollment size, ages served, group size, age groupings and child-staff ratio) and a program *culture of mastery*
- Consistent participation in a structured program
- Financial resources (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery, curricular resources in relevant content areas, and a location that is accessible to youth and families)
- Program partnerships and connections (with schools to connect administrators, teachers and programs; with larger networks of programs; with parents and community), and
- Program sustainability strategies (institutional partners, networks, linkages, community linkages that support enhanced services, long-term alliances to ensure long-term funding).

The resources recommended in the EB model could be used to provide struggling students in all elementary grades and in secondary schools with additional help during the school year but also before or after the normal school day.

25. Summer School

Recommendation:

- **1.0 teacher position for every 120 DHS Poverty Count students and**
- **1.0 teacher position for every 120 EL students.**

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Many students need extra instructional time to achieve their state's high proficiency standards. Thus, extended year or summer learning opportunities should be part of the set of programs available to provide struggling students the additional time and help they need to achieve to standards and earn academic promotion from grade to grade (Borman, 2001). Providing

additional time to help all students master the same content is an initiative that is grounded in research (National Education Commission on Time and Learning, 1994).

Resources for summer school are funded on the assumption that summer school programs are six to eight weeks long, with four or more hours of academic course work each day. We assume that half of the eligible students (low income and EL) will participate in classes of fifteen students.

Although the total summer school hours are not equivalent to a 0.25 FTE teaching position, it is funded at this level under the assumption that teaching summer school requires additional planning time outside of class. Thus, 120 eligible students would generate 60 summer school participants in four classes of 15 each staffed by a 0.25 FTE teacher for a total of 1 FTE for each 120 eligible students.

On average, students lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Summer breaks have a larger deleterious impact on poor children's reading and mathematics achievement. This summer learning loss (sometimes known as "summer slide" or "summer melt") can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). These income-based summer learning differences *accumulate* over the elementary school years, such that poor children's achievement scores – without summer school – fall further and further behind the scores of middle class students as they progress through school grade by grade (Alexander and Entwisle, 1996). There is consensus that what happens (or does not happen) during the summer can significantly impact the achievement of students from low-income backgrounds, and help reduce (or increase) the poor and minority achievement gaps in the United States (Allington, R.I, McGill-Franzen, A., Camilli, G., Williams, L. et al, 2010; Kim, J.S. & Quinn, D.M., 2013).

Evidence on the effectiveness of summer programs in improving achievement or closing the achievement gap, however, is mixed. Though past research linking student achievement to summer programs shows some promise, several studies suffer from methodological shortcomings and the low quality of the summer school programs themselves (Borman & Boulay, 2004).

The average student in summer programs among 93 studied outperformed about 56% to 60% of similar students not receiving the programs, but the quality of the studies and programs compromise the conclusions (Cooper, Charlton, Valentine, & Muhlenbruck, 2000).

The distinction between summer programs and specific learning opportunities is worth attending to in this instance. Specific types of learning activities can be tied more closely to improved achievement (Allington, R.I. et al, 2010; Kim, J.S. & Quinn, D.M., 2013) than the more generic summer school program, though randomized trial research of summer school reached more positive conclusions about how such programs can positively impact student learning (Borman & Dowling, 2006; Roberts, 2000). For example, Borman, Goetz, and Dowling (2009) found both practical and statistical significance of summer school participation in Developmental Reading Assessment (DRA) and the Word List A assessments in high poverty schools.

Borman and Dowling (2006) and Roberts (2000) note several program components related to improved achievement effects for summer program attendees, including:

- Early intervention during elementary school
- A full 6-8 week summer program
- A clear focus on mathematics and reading achievement, or failed courses for high school students
- Small-group or individualized instruction
- Parent involvement and participation
- Careful scrutiny for treatment fidelity, including monitoring to ensure good instruction in reading and mathematics is being delivered
- Monitoring student attendance

Summer programs that include these elements hold promise for improving the achievement of at-risk students and closing the achievement gap.

The effects of summer school are largest for elementary students when the programs emphasize reading and mathematics and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics

26. English Learners

Recommendation:

- **1.0 teacher position for every 100 identified EL students.**

This provision is in addition to intervention specialists and additional pupil support, extended day and summer school resources.

The current definition of EL students in Illinois are those who come from homes where English is not the native language and who have not obtained an overall composite proficiency level of 5.0 and a reading proficiency level of 4.2 and a writing proficiency level of 4.2 on the prior year ACCESS for ELs. This is in addition to the at risk resources of intervention teachers, extra pupil support, extended day and summer school which are resources for all EL students regardless of DHS Count.

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Research, best practices and experience show that in addition to the above resources, EL need assistance to learn English, in addition to instruction in the regular content classes. This can include some combination of small classes, English as a Second Language classes, professional development for teachers to help them teach “sheltered” English classes, and “reception” centers for districts with large numbers of EL students who arrive as new immigrants to the country and

the school throughout the year. EL students also receive the resources described above including tutors, additional pupil support, extended day and summer school.

In addition, EL students some additional services focused on ensuring their learning English. Funding is provided for *all* EL students for these additional services regardless of low income status.

Good EL programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. However, bilingual education is difficult to provide in most schools because students come from so many different language backgrounds. Nevertheless, bilingual programs have been studied intensively. A best-evidence synthesis of 17 studies of bilingual education (Slavin & Cheung, 2005) found that EL students in bilingual programs outperformed their non-bilingual program peers. Using studies focused primarily on reading achievement, the authors found an effect size of +0.45 for EL students. A more recent *randomized controlled trial* also produced strong positive effects for bilingual education programs (Slavin, et al., 2011), *but* concluded that the language of instruction is less important than *the approaches taken to teach reading*.

Addressing that important issue in *The Elementary School Journal*, Gerstein (2006) concluded that EL students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary, and reading comprehension. Gersten's studies also showed that EL students benefit from instructional interventions initially designed for monolingual English speaking students, the resources for which are included above in the four at risk student triggered programs: tutoring, extended day, summer school, and additional pupil support.

Beyond the provision of additional teachers to provide English as a Second Language instruction to students or other types of extra help for EL students, however, research shows that EL students need a solid and rigorous core curriculum as the basis from which to provide any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). This research suggests that EL students need:

- Effective teachers – a core goal of all the staffing in this report. Moreover, a recent study found that teachers who are effective with non-EL students are also effective with EL students, and vice versa. In addition, this study found that effective teachers who are fluent in the EL student's native language are even more effective with those students (Loeb, Soland & Fox, 2014).
- Adequate instructional materials (Element 15) and good school conditions.
- Good assessments of EL students so teachers know in detail their English language reading and other academic skills (Element 16).
- Less segregation of EL students.
- Rigorous and effective curriculum and courses for all EL students, including college and career ready, and affirmative counseling of such students to take those courses.
- Professional development for all teachers, focusing on sheltered English teaching skills (Element 14).

Hakuta (2011) supports these conclusions and also notes that English language learning takes time (one reason the EB model includes the above resources for every grade level) and that “academic language” is critical to learning the new Common Core Standards. The new standards require more explicit and coherent EL instructional strategies and extra help services, if these are to be effective at ensuring that EL students learn the subject matter English generally, and academic English specifically, i.e., learn how to read content texts in English. While this instruction requires smaller regular classes, those are already provided by the EB model, particularly at the early elementary level.

However, additional teaching staff are needed to provide English as a Second Language (ESL) instruction during the regular school day, such as having EL students take ESL in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of EL students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ESL program, each 100 EL students should trigger one additional FTE teaching position. This makes it possible to provide additional instructional opportunities for EL students to provide an additional dose of English instruction. The goal of this programming is to reinforce EL student learning of academic content *and* English so at some point the students can continue their schooling in English only.

Research shows that it is the Limited English proficient or EL students from lower income and generally less educated backgrounds, who struggle most in school and need extra help to learn both academics and English. The EB model addresses this need by making sure that the ESL resources triggered by just EL pupil counts are *in addition* to other Tier 2 intervention resources, including tutoring, additional pupil support, extended day and summer school resources as well as pupil support staff (Elements 22-25).

For example, a prototypical school with 125 at risk students and no EL students would receive 1.0 FTE core teacher and pupil support staff, and in addition, approximately 1.0 FTE tutor position, 1.0 FTE extended day, 1.0 FTE summer school, and 1.0 FTE additional pupil support resources. But if the 125 at risk children were all EL students, the school would receive an *additional* 1.25 FTE teacher positions primarily to provide ESL instruction.

Given these realities, it is more appropriate to view the EB approach to extra resources for EL students as including both resources for students from at risk backgrounds (unduplicated free and reduced price lunch recipients and EL) and ESL specific resources (Jimenez-Castellanos & Topper, 2012). That is a major reason why the EB model today augments the at risk student count to include the *unduplicated* count of students who are either free and reduced price meals recipients or EL. This ensures that all EL students trigger the extra resources for the Tier 2 interventions as well as the resources for ESL instruction.

27. Special Education (*mild and moderate disabilities*)

Recommendation:

- 1.0 teacher positions per 141 students for services for students with mild and moderate disabilities. Includes special education teachers and the related services of speech/language pathologists and/or OT PT as well as related social workers.
- 1.0 psychologist per every 1000 students
- 1.0 special education assistant per every 141 students.

Source: Using the Evidence-Based Method to Identify Adequate Spending Levels for Vermont Schools, November 2015, Picus Odden & Associates

Providing appropriate education services for students with disabilities, while containing costs and avoiding over-identification of students, particularly minority students, presents several challenges (see Levenson, 2012). Many mild and moderate disabilities, often those associated with students learning to read, are correctable through strategic early intervention. This intervention includes effective core instruction as well as targeted Tier 2 intervention programs, particularly one-to-one tutoring (Elements 6 and 22). For those with mild and moderate disabilities who require special programs as identified through an IEP, the EB model relies on a census-based formula that provides additional teaching resources based on the *total* number of students in a school. As described below, these resources are expected to meet the instructional needs of children with mild and moderate disabilities.

For children with severe and profound disabilities – low incidence, the Illinois EBFM model recommends that the cost of their programs, be appropriately supported through necessary categorical funding from the state. But reform is required here as well. There is a need for equalized funding for all students with low incidence needs based on a placement neutral basis. Current law in Illinois only supports private placement reimbursement, which is inappropriate and can contribute to placement of students in more restrictive environments. The Illinois EBFM recommends and supports a placement neutral proposal prepared by IAASE and ISBE.

In their book on the best approaches to serve students with disabilities, Frattura and Capper (2007) conclude that both research and most leading educators recommend that educating students in general education environments results in higher academic achievement and more positive social outcomes for students with and without disability labels, as well as being the most cost effective way to educate students. Thus, they recommend that school leaders focus their efforts on preventing student underachievement and alter how students who struggle are educated. Doing so, they argue, will overcome the costly and low performance outcomes of multiple pullout programs. Further, fewer students will be inappropriately labeled with a disability, more students will be educated in heterogeneous learning environments, and higher student achievement and a more equitable distribution of achievement will result (Frattura & Capper, 2007). Illinois schools have implemented this philosophy for years and it is the philosophy behind the Evidence-Based model as well.

The core principles of such a proactive approach to teaching students with disabilities are that the education system needs to adapt to the student; that the primary aim of teaching and learning is the prevention of student failure; that the aim of all educators is to build teacher capacity; that all services must be grounded in the core teaching and learning of the school and particularly skilled teachers; and, that to accomplish this, students must be educated alongside their peers in integrated environments (Frattura & Capper, 2007).

Supporting this argument, research shows that many mild and moderate disabilities, particularly those associated with students learning to read, are correctable through intensive early intervention. For example, several studies (e.g., Borman & Hewes, 2003; Landry, 1999; Slavin, 1996) have documented that through a series of intensive instructional interventions (e.g., preschool, small classes, rigorous reading curriculum, 1 to 1 tutoring), nearly 75 percent of struggling readers identified in kindergarten and grade 1 can be brought up to grade level without the need for placement in special education. Other studies have noted decreases in disability labeling of up to 50 percent with interventions of this type (see for example, Levenson, 2011; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996).

That is why the EB recommendations for extended learning opportunities (Elements 22, 24 and 25) are so important. They, along with core tutoring and pupil support services, are the series of service strategies that can be deployed *before* IEP specified special education services are needed. This sounds like a common sense approach that would be second nature to educators, but often educator practices have been rooted in a “categorical culture” that can be modified through professional development and leadership from the district office and the site principal. Using a census approach to providing most of the extra resources for students with disabilities, an approach increasing in use across the country, works best for students with mild and moderate disabilities, but only if a functional, collaborative early intervention model (as outlined above) is also implemented. At the same time, it is perfectly legal for a student’s IEP to call for tutoring, extended day help or summer school services that are part of the EB model, even though the services may not be provided by a person with a special education certification.

This proactive approach to special education is evident in the Individuals with Disabilities Education Act (IDEA) of 2004, which changed the law about identifying children with specific learning disabilities. The reauthorized law states that schools will “not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability ...” (Section 1414(b)). Instead, in the Commentary and Explanation to the proposed special education regulations, the U.S. Department of Education encourages states and school districts to abandon the IQ-achievement discrepancy model and adopt Response to Intervention (RTI) models, also discussed above, based on recent research findings (Donovan & Cross, 2002; Lyon et al., 2001; President’s Commission on Excellence in Special Education, 2002; Stuebing et al., 2002). An RTI model, what we call a proactive approach above, identifies students who are not achieving at the same level and rate as their peers and provides appropriate interventions, the first ones of which should be part of the “regular” school program and not funded with special education resources (Mellard, 2004).

The core features of RTI, which is a critical part of the EB approach, include:

- High quality classroom instruction
- Research-based instruction
- Classroom performance
- Universal screening
- Continuous progress monitoring
- Research-based interventions, that would include 1-1 tutoring
- Progress monitoring during interventions, and
- Fidelity measures (Mellard, 2004).

Common attributes of RTI implementations are: a strong core instructional program for all students; multiple tiers of increasingly intense student interventions; implementation of a differentiated curriculum; instruction delivered by staff other than the classroom teacher; varied duration, frequency, and time of interventions; and categorical or non-categorical placement decisions (Mellard, 2004). This proactive model fits seamlessly into the EB broader approach to helping all struggling students through early interventions.

In many instances, this approach requires school-level staff to change their practice and cease functioning in “silos” that serve children primarily in “pullout” programs identified by funding source for the staff member providing the services (e.g. General Fund, Special Education, Title I). Instead, all staff would team closely with the regular classroom teacher to identify learning challenges and work together to address them as quickly as possible.

For children with more severe disabilities, clustering them in specific schools or at the district level to achieve economies of scale is generally the most effective strategy and provides the greatest opportunity to find ways to mainstream them (to the extent feasible) with regular education students. Students in these categories generally include: severely emotionally disturbed (ED), severely mentally and/or physically handicapped, and children within the autism spectrum. The ED and autism populations have been increasing dramatically across the country, and it is likely that this trend will continue in the future. To make the provision of services to these children cost-effective, it makes sense to explore clustering of services where possible and design cost parameters for clustered services in each category. In cases where students need to be served individually or in groups of two or three because of geographic isolation, it would be helpful to cost out service models for those configurations as well, but provide full state funding for those children. This strategy would reduce the likelihood of overwhelming the financial capacity of a small school district that happens to be the home of a child with a severe disability.

The census approach to funding core special education services, can be accomplished by providing additional teacher resources at a fixed level. The census approach emerged across the country for several reasons:

- The continued rise in the number and percentage of “learning disabled” students and continued questioning by some of the validity of these numbers
- Under-funding of the costs of severely disabled students

- Over-labeling of poor, minority, and EL students into special education categories, which often leads to lower curriculum expectations and inappropriate instructional services, and
- Reduction of paperwork.

Often, the census or mainstream approach for the high-incidence, lower-cost students with disabilities is combined with a different strategy for the low-incidence, high-cost students, whose costs are funded separately and totally by the state (with the exception of basic education funding), as these students are not found proportionately in all districts. This is the catastrophic funding for school districts that provides resources for special education students who require services exceeding some figure (after Medicaid, federal special education grants, and other available third-party funding are applied).

Today, diverse states such as Alabama, Arkansas, California, Montana, North Dakota, Pennsylvania, and the New England states of Massachusetts and Vermont all use census-based special education funding systems. Moreover, all current and future increases in federal funding for disabled students are to be distributed on a census basis.

The issue then becomes the staffing standards for the various categories of special education personnel:

- Teachers for students with mild and moderate disabilities
- Related services for students with particular needs,
- Costs associated with developing and continually reviewing IEPs.

Each of these is addressed below.

Mild and moderate Disabilities/Related Services

The EB provision for resources for students with mild and moderate disabilities is 1 teacher and 1 aide for every 141 regular students, which is broken down to .83 FTE special education teacher and .17 FTE related services for every 141 students. This allocation is appropriate to serve an overall incidence rate of 12 percent, where there is an assumption that 1 to 2 percentage points of that total would be for children with severe and profound disabilities. Leaving approximately 10 percent with mild and moderate disabilities and half of those students also requiring related services such as speech/hearing pathologists, OT and/or PT.

For a prototypical district containing 2 elementary schools with 450 students each, one middle school with 450 students and one high school with 600 students, the total number of special education personnel allocated by the model is as follows (rounded):

• Elementary (2 schools)	5.0 FTE Teachers	1.0 FTE Related Services
• Middle School	2.5 FTE Teachers	.5 FTE Related Services
• High School	5.8 FTE Teachers	1.2 FTE Related Services
Total	<u>13.3 FTE Teachers</u>	<u>2.7 FTE Related Services</u>

District by district the needs of particular students will differ, therefore, these are only representative allocations. Flexibility for each district to allocate between teachers and related services or collaborate/contract for various services with a special education cooperative is essential.

Psychologists

Finally, districts need psychologists for the primary role of overseeing the development and continued review of Individual Education Programs, which must be reviewed and reassessed every three years. A typical standard for psychologists is 75 IEPs a year. At a special education incidence rate of 16%, a group of 1,000 students would have 160 who needed an IEP. As IEPs are reviewed every three years, that reduces the burden to 53. On the other hand, for every 1,000 Prek-12 students there typically would be the need to go through the IEP review process for an additional 20 or so students for incoming preschoolers, kindergartners and first graders, many of whom would need the review but most of whom would not actually receive an IEP. This adds to the 53 another 20 IEP reviews for a total of 73. At a typical load of 75, a group of 1000 K-12 students would trigger the need for an additional 1.0 psychologist.

Total EB recommendation for special education:

- 1.0 teacher/related services positions per 141 students for services for students with mild and moderate disabilities and for the related services of speech/hearing pathologists and/or OT PT.
- 1.0 special education aide positions per 141 students for services for students with mild and moderate disabilities.
- 1 psychologist or other related services for every 1,000 students.

Regardless of funding source, school districts and special education cooperatives will continue to be responsible for adhering to all federal and state laws and regulations associated with the delivery of appropriate programming and services.

RESEARCH EFFECT SIZE CHART

Effect size is the amount of standard deviation in the higher performance that the strategy produces for students compared to students who were not exposed to the strategy. An effect size of 1.0 would indicate that the average student's performance would move from the 50th to the 83rd percentile.

The research field generally recognizes effect sizes greater than 0.25 as significant and greater than 0.50 as substantial.

Recommended Strategy	Effect Size
Full Day Kindergarten	0.77
Class Size of 15 in Grades K-3	
Overall	0.25
Low Income and Minority Students	0.50
Multi-age Classrooms	
Multi-grade Classrooms	-0.1 to 0.0
Multi-age Classrooms	0.0 to 0.50
Professional Development with Classroom Instructional Coaches	1.25 to 2.70
Tutoring with Tier 2 Intervention Teachers, 1-1 and small group	0.4 to 2.5
English Language Learners Direct Intervention Support	0.45
Structured Academic Focused Summer School	0.45
Embedded Technology	0.30 to 0.38
Gifted and Talented	
Accelerated Instruction or Grade Skipping	0.5 to 1.0
Enrichment Programs	0.4 to 0.7

It is important to note that strategies must be implemented in accordance with research-based assumptions in order for potential effects to be realized. (i.e. if expansion to full day kindergarten is only focused on lunch, recess and rest – little effect will be realized)

Source: Odden, A. R., Picus, L. O., Goetz, M., Mangan, M. T., & Fermanich, M. (2006). An evidence based approach to school finance adequacy in Washington. Prepared for Washington Learns. North Hollywood, CA: Lawrence O. Picus and Associates. Retrieved from:
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VISION 20/20 COMMITTEES

When introduced in November of 2014, Vision 20/20 established four areas of prioritization, or pillars. To fully realize the goal of Vision 20/20, Pillar Committees were created in the 2015-2016 school year to generate recommendations for changes and improvements of the existing policy platform and upcoming legislative agenda. The advisory committee represents partner organizations and guides the direction of the Vision 20/20 initiative.

Advisory Committee

Dr. Sheila Harrison-Williams (SCSDD);
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Jeff Vose (ROE 51);
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Dr. Kevin O'Mara (HSDO);
Matthew John Rodriguez (PTA);
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Tom Hochstein (Horace Mann);
Amber Heffner (ICE);
Linda Lucke (DKG);
Phil Morris (Technology Leader Group);
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