

Expanded Learning Opportunities and Cognitive Outcomes for At-Risk Children

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INTRODUCTION

The purpose of this paper is to present high-level findings from a review and synthesis of the literature on expanded learning opportunities (ELO) for at-risk children. More specifically, this paper addresses whether (and to what extent) ELO programs can increase cognitive outcomes and academic achievement for at-risk children.^{1 2}

There is a surprisingly robust research base on ELO programs and their impacts on children. Much of this research has been done in the past 15 years with the passage of the No Child Left Behind (NCLB) Act of 2001 serving as a major catalyst. Over 95% of the studies included in this research synthesis were conducted over the last 15 years.

ELO programs vary along a number of dimensions including age group served, instructional purpose, dosage, type of provider, and setting.³ This research synthesis covers over 100 ELO studies and, while these studies also vary along the same dimensions, they are limited to programs and children in the U.S. and programs serving children between the summer before pre-k up through high school.⁴

THE NEED FOR ELO PROGRAMS

Public interest in ELO programs is high with between 20% and 30% of U.S. children attending such programs (Laughlin, 2009; Carver & Iruka, 2006) and unmet demand for at least another 25% of U.S.

¹ We refer to these programs as "expanded learning opportunities" and this term as well as "out-of-school time" is used in the literature. Expanded learning opportunities does not imply a specific time, schedule, duration or location; but it does mean that, during those hours, children are doing something other than activities mandated by regular school attendance (Lauer, 2006). The most common way ELO programs are described is on the time dimension with "afterschool" and "summer" being the most common forms. Some experts in the field refer to ELO programs as "expanded learning opportunities."

² ELO programs use different definitions of "at-risk children" however children living in poverty is a good proxy for these definitions. These children are more likely to have higher than average risks in their home environment, in their neighborhoods, and in low-quality care - all of which can be detrimental to cognitive outcomes.

³ Examples of "instructional purpose" include programs that: a) Provide remedial instruction focused on skills children are failing to master in school or; b) Prepare students with skills needed to be ready for school- or grade-entry.

⁴ Abbreviated P-12 in other sections of this report.

children (Alliance, 2014). Research shows that working parents want their children to participate in safe, structured and enriching expanded learning activities during non-school hours though many low-income families struggle to find and afford such programs (United Way, 2016). Furthermore, there is increased recognition that at-risk children often start school behind their peers (the achievement gap) or fall behind their peers in school and have difficulty catching up. ELO programs - before school, afterschool, and during the summer (or during other breaks from school) - can provide the extra time and attention for this catching up to occur (Gersten, 2009). Combined with high-quality pre-k and full-day kindergarten programs, at-risk children can close a substantial part of the achievement gap before it opens wider and wider through elementary school and beyond (Alexander, 2007).

Research also indicates that, without intervention, many at-risk students drop out of high school or enter the labor market with insufficient skills companies need to compete in the global economy (Woodland, 2008). These dropouts are much more likely to become a significant economic burden on society via criminal justice costs, unemployment benefits, welfare programs, etc. A feature of particularly effective ELO programs serving at-risk high school students is a combination of academic instruction with career or college skills (Lauer, 2006). To the extent that ELO programs change the trajectories of at-risk youth - academically, socially, emotionally, psychologically - they can benefit the families and children they serve throughout their lives.

In the last decade much more has been learned about summer learning loss and its disproportional impact on at-risk children. Meta-analysis shows low-income children losing an average of 1-2 months of literacy skills over the summer while middle-income children hold steady and upper-income children actually improve their literacy skills by an average of 1 month over the same period (Benson & Borman, 2010; McCombs, 2011). Summer learning loss has an even greater negative effect on children with special educational needs (Cooper, 1996; Lawrence, 2011).⁵ For at-risk children, research indicates these losses may be cumulative over successive summers (McCombs, 2011). A number of summer ELO programs have been shown to moderate or eliminate summer learning loss with at-risk children in the earliest grades among those benefitting most (Roderick, Engel & Nagaoka, 2003; Borman & Dowling, 2006; Chaplin & Capizzano, 2006; Alexander, 2007; McCombs, Augustine, & Schwartz, 2011; McCombs et al., 2014).

Separately, especially for young children, there is concern from various corners that ELO programs are an additional intrusion on the time children need to be children, engage in play and other socialization, etc. High-quality ELO programs for young children are deeply-rooted in play. While direct instruction is an important component of these programs, research with young children shows that a combination of guided play and direct instruction is most effective (Kagan & Lowenstein, 2004). High-quality ELO programs make learning fun and engaging. This is especially important for at-risk children of all ages who may already believe that learning is a chore and something "they are not good at."

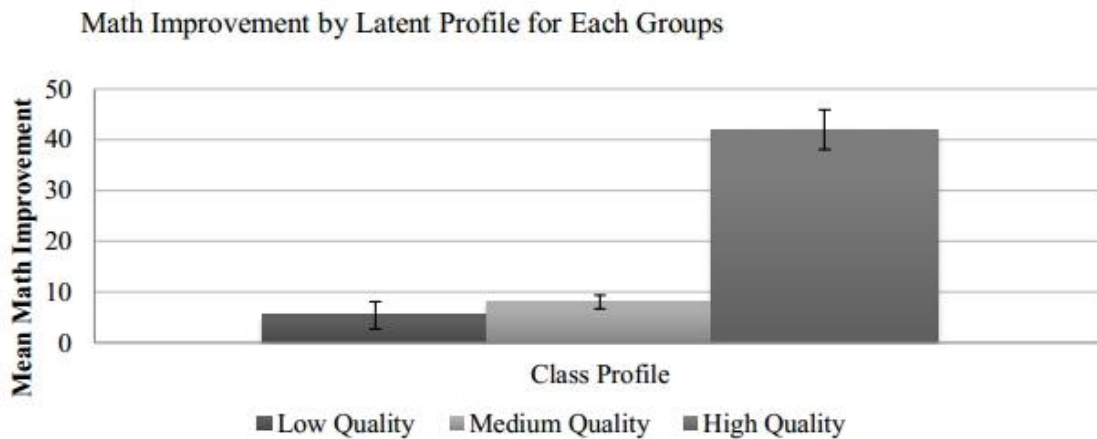
⁵ For example, children who speak a language at home other than English may have their acquisition of English language skills set back by an extended period without its usage.

HIGH-QUALITY IS THE MINIMUM NECESSARY FOR ELO PROGRAMS TO HAVE IMPACT

Just as numerous studies have shown that only high-quality pre-k has cognitive impacts and benefits for young children, the same holds true for ELO programs. Quality in these programs matters just as it matters in other types of youth services (Hirsch, Mekinda & Stawicki, 2010; Yohalem & Wilson-Ahlstrom, 2010; Smith, et al., 2012).

For example, a 2015 study conducted in thirty summer learning program offerings at eleven school sites in Seattle reported three key findings:

- 1) Summer programs can be divided into three performance subgroups with distinct quality profiles: High, moderate, and lower quality.
- 2) Students in offerings with very high quality instruction had more positive change on math and literacy assessments when compared to students receiving moderate and lower quality instructional experiences.



- 3) On average, these summer program offerings demonstrate high levels of instructional quality compared to summer programs in other cities. These findings suggest that benchmarks for high quality instruction can be identified and that high quality instructional experiences are associated with gains in academic skills (Smith, 2015).

Just as in other educational settings, positive staff-child relations and high-quality instruction are the most essential elements for ELO programs that result in academic and socio-behavioral gains (Vandell, 2013; Yohalem, 2013).

HIGH-QUALITY ELO PROGRAMS WITH IMPACTS THAT STICK

While the benefits of high-quality pre-k and kindergarten have been shown to last throughout elementary school (the furthest out measurement has been applied to-date) there are almost no longitudinal studies on ELO programs. One study examined the effects of a summer program in an unnamed large, urban school district on the following year's assessment performance. They found an average positive effect for both reading and mathematics and achievement the following spring (Matsudaira, 2008).

Two longitudinal studies have shown the benefits of high-quality summer learning programs endure for at least two years after children have engaged in one of these programs (McCombs, 2011).⁶ More longitudinal research is needed to determine whether the benefits of high-quality ELO programs stick longer-term.

SOCIOEMOTIONAL SKILLS: A FOUNDATION FOR ACADEMIC GAINS

High quality ELO programs are linked to gains in social skills with peers, increased pro-social behavior, and reductions in aggression, misconduct, etc. (Vandell, Reisner, & Pierce, 2007). These opportunities also demonstrate promise because they have been shown to increase student engagement, intrinsic motivation, concentrated effort, and positive states of mind (Larson, 2000; Shernoff & Vandell, 2008). Furthermore, these findings are significant because the social and emotional outcomes that are fostered through high quality ELO programs help lay the psychological groundwork for the kinds of cognitive processes that are required for mastery of academic content knowledge and skills to apply that knowledge (Durlak 2010; Vandell, 2013).

Likewise, we know from research that engagement in activities that are both fun and that require focus helps develop the competencies children need for academic learning, including concentration, intrinsic reward, and motivation (Shernoff & Vandell, 2007; 2008). For example, in the Study of Promising After-School Programs, students who regularly attended high quality programs demonstrated significant gains in standardized mathematics test scores as well as self-reported work habits (Vandell, Reisner, & Pierce, 2007; Vandell, 2013).

High quality ELO programs can also foster a growth mindset in the children they serve. Specifically, student belief that their *ability and competence grow with their effort* appears to have a powerful impact on

⁶ See also Roderick, Engel, & Nagaoka (2003) and Jacob & Lefgren (2004) who studied the effects of the Chicago Public School's Summer Bridge Program and found that positive effects persisted for two years after the summer program.

their persistence and academic performance. Students with a growth mindset believe that academic ability is changeable rather than being fixed and they tend to attribute their academic performance to the amount of effort they put into their work, rather than to innate ability, luck, or other factors beyond their control.⁷

Developing a growth mindset may be especially important among children experiencing "school" for the first time - children whose academic and socioemotional mindset may just be forming. It may be doubly important to instill a growth mindset among at-risk children who arrive at school significantly behind their peers, significantly less likely to have a growth mindset, and who may quickly be slotted into remedial school- and potentially low-quality ELO programs.

High quality ELO programs can play an important role in shifting mindsets, thereby yielding better academic and socioemotional outcomes (short-term and long-term) for children (Mayr & Ulich, 2009).

IMPACT OF HIGH-QUALITY ELO ON COGNITIVE OUTCOMES AND ACADEMIC ACHIEVEMENT

Analysis and meta-analyses have been done to measure the cognitive and academic impact of high-quality ELO programs on at-risk children. (Cooper & Charlton, 2000) found that the average weighted effect size for remedial summer programs included in their study was .20. However, when the authors restricted the analysis to the four studies that used a random assignment of students (a stronger methodology) the average effect size was reduced to .14 (McCombs, 2011).

One of the most comprehensive meta-analyses done on program effectiveness looked at a variety of high-quality ELO programs and their impact on at-risk student achievement in reading and mathematics. In that study combining reading and mathematics outcomes resulted in an average effect size of .11.⁸ Furthermore, only ELO programs that had a primarily academic focus had any impact on literacy/reading outcomes that was significantly different from zero (Lauer, 2006).

To put these effect sizes in context, Table 1 compares exemplar pre-k program effect sizes to high-quality ELO program effect sizes (Cooper & Charlton, 2000; Lauer, 2006; Minervino, 2014).

⁷ This draws from decades of research by Carol Dweck, Greg Walton, and others summarized in Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *The Role of Noncognitive Factors in Shaping School Performance—A Critical Literature Review*. Consortium on Chicago School Research, Chicago, IL.

⁸ We calculate this number by averaging reading and math effect sizes based on fixed- and random-effects models.

TABLE 1
Impact-at-a-Glance

<u>Program</u>	<u>Achievement Effect Sizes (<i>d</i>)</u>
Boston Pre-K *	.55
NJ (Abbott) Pre-K	.40
ELO (per Cooper)	.14
ELO (per Lauer) **	.11

* Average effect size for vocabulary, early reading, and early math

** Average effect size for reading and math

As ELO programs typically supplement regular schooling we don't expect to see the same effect sizes as we see for full-day, nine-month programs (e.g., 1,000+ hours of high-quality pre-k). Net-net, meta-analyses suggest high-quality ELO program effect sizes in the range of .10 to .15 -- roughly equivalent to a 4-6 percentile increase on standardized tests.^{9 10}

The ELO program impacts (effect sizes) noted above are meaningful. It should also be noted that, with the exception of 1-1 tutoring, it appears increasing ELO dosage beyond 80-90 hours per child per subject area would result in diminishing returns.¹¹

Finally, an important finding of the Chicago Longitudinal Study was that high-quality preschool *and* school-year supplementation (ELO) was most effective in combination - one building on top of the other to create greater effects (Alexander, 2007). In theory, this concept should apply to the combination of high-quality K-12 and school-year supplementation (ELO) however the research base on this topic is sparse.

⁹ A different perspective: A percentile increase of this size is similar in magnitude to a 15-30 point increase in a high-school student's SAT Critical Reading score.

¹⁰ Both Cooper & Charlton (2000) and Hill (2007), in a study of children in elementary school, reported that high-quality summer ELO programs drive gains in math and literacy/reading but larger gains in mathematics than in literacy/reading.

¹¹ See section on "Dosage" later in this report for more information on this subject.

THE ESSENTIAL ELEMENTS OF HIGH-QUALITY ELO PROGRAMS¹²

This section summarizes which elements are essential elements in high-quality ELO programs getting proven results for at-risk children. At the outset, it should be noted that many of these elements are the same or similar to those required to get sustained outcomes for young at-risk children in their early schooling. However, there are important differences between ELO programs and schooling for young children so that ELO programs have a number of unique essential elements of their own.

High-quality ELO programs that have impact are the result of doing many things well. Essential elements must not only be present and well-executed. This "doing many things well" requirement results in a high degree of difficulty and is a key reason why many ELO programs fail to get results.

First, the essential elements that effective pre-k/kindergarten programs (Minervino, 2014)¹³ and ELO programs for children ages 4-18 have in common.

1. **An enabling environment.** This includes a clear and compelling vision, strong leadership, and a culture of continuous improvement. This may include political, foundation and/or community support.
2. **Teachers and staff generating supportive, positive interactions with children and delivering high-quality instruction.** Supportive, positive teacher-child interactions and high-quality instruction are the bases on which successful ELO programs are built. Positive interactions and quality instruction are **not** mutually-exclusive in any way. In fact, they appear to function as "1+1=3" with definitive results showing increases in child self-confidence and self-esteem improving child performance on achievement tests and in their school grades (Eccles & Gootman, 2002; Durlak, 2010). The idea that ELO teachers/staff can learn to have high-quality interaction and instruction is supported by a growing base of evidence. See the discussion on Professional Development later in this section.
3. **Child-to-teacher/staff ratios and maximum class size.** Research has found that small class size is associated with program effectiveness. Smaller class sizes provide teachers with more time to work individually with students and to create greater opportunities to differentiate instruction based on student needs (McCombs, 2011). Potential ratios and group size in ELO programs can range from 1-to-1, 1-to-few, and 1 (or more)-to-many. While there is no evidence in the ELO literature of a specific upper threshold for class size, Cooper & Charlton, (2000) found that programs in which class size was capped at 20 students were more effective in producing achievement gains.

¹² There have been numerous studies highlighting important elements of high-quality ELO programs though, in our opinion, no single study consolidating the essential elements in one place.

¹³ Note that some "essential elements" are not listed here and are reasonably assumed. Examples include the safety of children/teachers/staff, children attend the ELO program, age-appropriate activities are present, etc.

As to the lowest ratio, there is overwhelming evidence that high-quality ELO program offering 1-to-1 tutoring get significantly better reading outcomes than programs implementing any other child-to-teacher/staff ratio (Elbaum, 2000). However for math instruction ELO programs using small group instruction generally perform better than programs with large group instruction or even 1-to-1 tutoring in some instances (Lauer, 2006).¹⁴

4. **Teacher/staff qualifications and compensation.** While K-12 school systems have kept teacher and staff qualifications and compensation *relatively* high, ELO program teachers and staff are poorly paid and suffer high turnover. The work has hours and pay that make it "not a career job."¹⁵ ELO teachers and staff tend to be young, part-time workers most often making a limited-time commitment. ELO organizations are working to professionalize the field through credentialing pathways, scholarships and certification but these have not taken hold widely. It is not clear whether teachers with a B.A., A.A., other credential, or no credential have significantly different impacts on child outcomes. This is an area in which more (and higher-quality) research is needed.
5. **Dosage.**¹⁶ As ELO programs vary in their mission and purpose and children differ in their needs, the optimal cumulative hours children spend in these programs to get the highest benefit will vary.

In Lauer's meta-analysis of high-quality ELO programs for at-risk children, approximately 44 hours was the minimum dosage required for measurable outcomes in reading or mathematics.¹⁷ Shorter duration programs had no impact. McLaughlin and Pitcock (2009) recommend that programs be a minimum of 80 hours in total while Jenner and Jenner (2007) found that elementary school students should attend ELO programs for at least 30 days annually.

But, beyond "in-the-ballpark agreement" on minimum dosage required for impact, results at higher dosage are mixed. While Lauer's meta-analysis and other studies find some evidence that larger dosages (100+ hours) of high-quality ELO programs improve outcomes, other studies find rapidly diminishing marginal gains in academic outcomes or no impact on academic outcomes at higher dosages (Roth, 2010). Likewise, in examining dosage-by-age of participants, Lauer reports some differences, Roth and others find little- to no evidence of differential outcomes due to varying dosage-by-age of participants. Some researchers have suggested that consistency of attendance and participation in ELO programs is more important than total dosage but this has not been proven empirically.

¹⁴ Of course this is independent of the cost to deliver such outcomes and these costs will be discussed in their own section later in this paper.

¹⁵ Granger, Robert, quoted in Education Week, April 4, 2012.

¹⁶ Dosage data refers to the estimated amount of time at-risk children spend in ELO programs whose primary focus is academics. The academic literature is replete with different definitions for dosage, duration, frequency, etc. When citing dosage data the author has relied on definitions given in each paper or directly from the authors of cited papers.

¹⁷ A grand total of 88 hours - 44 hours for the reading program, 44 hours for the mathematics program.

Again, as ELO programs and child needs vary, this dosage data should be treated as a gross approximation of the time needed to have significant impact on cognitive outcomes and academic achievement. For at-risk children entering school on a low trajectory (in the lowest quintile of school readiness) or diagnosed with special needs, for K-12 children who are one year or more behind their peers (regardless of reason), and for children living in homes in which English is not spoken, it is likely that a larger-than-standard dose of high-quality ELO is required to change their learning trajectory.

Finally, there is general agreement in the field that considerably more research needs to be done to provide definitive guidelines for ELO dosage and to standardize definitions for dosage, duration, etc.

6. **Learning standards/objectives and curriculum designed to meet those standards and objectives.** High-quality ELO programs and ELO groups (e.g., National Institute on Out-of School Time) have developed and refined ELO learning standards - especially in recent years. As with P-12 standards, practice has shown that: a) Fewer, better standards are more effective than overly-comprehensive standards (fewer standards are more likely to be well-understood and used); b) Standards covering multiple domains (e.g., health, social-emotional, cognitive) are essential for children and; c) Standards and learning objectives that connect and complement ELO program time with classroom time are essential.

High-quality ELO programs generally choose research-based curricula, develop their own curricula and refine it through continuous monitoring and improvement, or some combination of both of these approaches. Regardless, curricula must be tightly-coupled with ELO learning standards and objectives, connected to an ELO program's system for professional development, and adhered to with very high fidelity.¹⁸ In exemplar programs, the quality of teacher-child interactions is high and the content focus of those interactions is guided by the curriculum in use.¹⁹

While high-quality ELO programs have been successful in melding their curriculum with their learning standards, they concur that training teachers thoroughly on new or revised curriculum is a time-consuming process—yet a process absolutely necessary and one that can never be shortchanged. These programs operate with the knowledge that high-fidelity to curriculum can only be achieved through deep training, continuous monitoring, and the provision of actionable feedback directly to teachers and staff.

7. **Professional development.** Ongoing professional development (PD) regarding standards, curricula, child assessment, and improving the quality of instruction are essential aspects of high-quality ELO programs. These programs share a philosophy that PD is most effective when a culture of high

¹⁸ High-quality ELO programs recognize that strong curricula executed well—combined with high-quality instruction—is a very potent force for driving superior outcomes for children.

¹⁹ Project Accelerated Learning is a good example for this. The program combines the essential elements listed here with thematic curriculum (e.g., foods, sea life...) reflected in each activity center. In this 30-week after school program, at-risk kindergarten participants experienced gains in literacy learning as compared with their peers in the control group. (Hausner, 2000)

expectations for teachers and students is present and a culture focused on continuous self-improvement is shared by program leadership, teachers and staff. PD focused on the quality of teacher/staff-child interactions (supportive of child needs paired with high-quality instruction) and improving student outcomes is most effective.

As with P-12 systems, investments in professional development are most valuable when they are effective (as described above) and when teacher retention is high. Teacher retention is a critical issue for ELO programs and most are failing to retain their best teachers and staff over the time required for PD investments to fully pay off. Given the ELO workforce issues discussed earlier in this paper, this may be the most important, limiting issue keeping most ELO programs from achieving and maintaining high-quality and substantial outcomes for at-risk children.

8. **Assessment and program evaluation.** In high-quality ELO programs, assessment generally occurs at the program-, teacher-, and student-level. These assessments are used to drive system improvements and to improve performance and outcomes for children.²⁰ Independent program evaluation is used to look at overall program quality, outcomes, and effectiveness for children.

While many ELO programs conduct assessments, high-quality programs rely on them and use them most effectively. Consistent with cultures of ongoing self-improvement and a focus on outcomes for children, these programs make aggressive use of assessments to inform administrators, teachers, and students about what is working well and what needs to be fixed, while identifying teachers and students who need more or different types of help to improve.

Systematic program evaluation—including monitoring program implementation—is also critical. Having the essential elements of high-quality ELO programs present doesn't matter if implementation of these elements is poor. High-quality ELO programs recognize this and use program evaluation data to drive continuous improvement at all levels.

Finally, high-quality ELO programs bring together the time, space, and resources to work directly with teachers and children who need extra support.

9. **Aggressive use of data and data systems.** High-quality ELO programs make aggressive use of data (e.g., assessment and program evaluation data noted above) and have built data systems to supply their early learning systems with the most important and actionable data available. This creates a data-rich environment where data is studied, drives recommendations, and most importantly, is used to drive action and superior outcomes for children (Smith, 2012).²¹

²⁰ The Youth Program Quality Assessment (YPQA) and its counterpart for children (School-Age PQA) are often used to measure the quality of ELO programs. These assessments combine teacher/staff observation and feedback, interviews, and self-assessment and are also used to identify staff training and professional development needs.

²¹ A good example of this is the Youth Program Quality Intervention (YPQI), a data-driven continuous improvement model for school and community-based sites serving youth during afterschool hours. The estimated cost for YPQI training and technical assistance runs is \$333 per staff member participating.

10. High-quality ELO programs combine standards, curriculum, professional development, assessment, and data/data systems and use them systematically - **tied together in a system** where each supports and reinforces the others - to drive continuous improvement. This is the result of leadership, careful planning, and execution of strategies designed with each of the five listed elements in mind.
11. **Customized support for English Language Learners (ELLs) and Special Education.** High-quality ELO programs emphasize the importance of having specific strategies and plans for these children. This generally involves specially-trained teachers/staff and intensive 1-to-1 or 1-to-few instruction. ELO programs note that this customized support can be expensive and may be financially out-of-reach for many families.

While the essential elements enumerated above often apply to P-12 and ELO programs for at-risk children, ELO programs are significantly more variable in structure, size, and setting than P-12 classrooms. The result is some unique essential elements that apply to high-quality ELO programs.

12. **Differential instruction.** Recognizing that children come with different cognitive and socioemotional needs, high-quality ELO programs can be tailored to children's specific needs. This is more likely to happen in low child-to-teacher ratio settings the most extreme being 1-1 tutoring and instruction.

Research shows that summer ELO programs that intended to provide individualized instruction were more effective than programs without this intention (Cooper and Charlton, 2000). Similarly, research and experts recommend that teachers work with small learning groups (Boss and Railsback, 2002; Beckett, 2008). Differentiated or individualized instruction is an intended component in many classrooms; however, it is often difficult for teachers to implement. When faced with large class sizes and a broad range of ability levels, differentiation is a challenge. Summer and afterschool programs with smaller class sizes should provide an opportunity for teachers to offer more individualized instruction to students (McCombs, 2011).

13. **School, child care, and ELO connection.** High-quality ELO programs add another weapon to the arsenal of supports designed to help at-risk children succeed. A potential weakness of these programs is that they add another another ["double another" intended]. In creating an additional time and place in which teachers and staff work with children, there is the potential for ELO programs to become an island - uncoupled from a child's experiences in other modes of education and care. To avoid this, tight coupling between school, child care, and ELO programs is essential. For example and not surprisingly, aligning the school-year and ELO curricula improves the effectiveness of ELO programming (Boss and Railsback, 2002; McLaughlin and Pitcock, 2009; Beckett, 2008).

Likewise, high-quality end-of-grade and end-of-program handoffs are essential. This includes end-of-school-year handoffs to summer ELO programs and summer ELO program handoffs to schools

among others. When ELO programs function as both a supplement and a complement to schooling, the odds of successful child outcomes are greatly improved.

14. **Parent/caregiver engagement.** That schools and ELO programs should engage parents is a given. Because ELO programs create an additional place and time for learning, parents and caregivers must be engaged and often must act as "traffic cop" between programs, school, and child care.

Additionally, the research base is definitive that parent/caregiver reinforcement of cognitive and socioemotional learning leads to superior outcomes for children. Parents and caregivers can only play that reinforcing role if they have a solid understanding of what children are learning in all of the environments in which they are placed.

15. **Costs.** High-quality ELO programs, according to their duration and dosage, are either expensive or out-of-reach for many families with at-risk children. These programs can only be delivered to the bulk of children who need them with the support of public and/or private (and ideally stable) funding over time. This is especially true for more intensive ELO programs work with English language learners and children needing special education services and support.

Perhaps the most interesting "non-essential element" is the tradeoff in effectiveness between afterschool (or before school) ELO programs and summer ELO programs. Research indicates no difference in the effectiveness of these approaches.

THE COST OF HIGH-QUALITY ELO PROGRAMS ²²

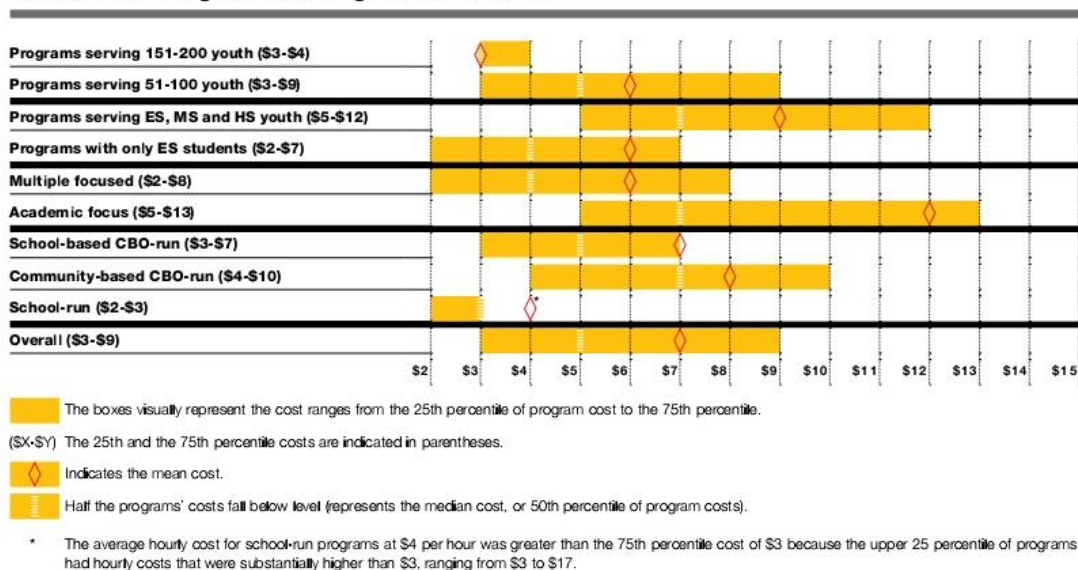
The cost of quality programs varies depending on a range of factors including program goals, times of operation, special needs, and the ages of children served. In addition, a comprehensive examination of costs must look at the full costs of providing quality programs including cash outlays, the value of non-monetary contributions, the cost of physical space, etc.²³

For programs serving elementary school children, the average hourly cost (2005 dollars) was approximately \$7 per slot during the school year, with costs ranging from \$3 to \$9 for most programs. During the summer, the average hourly cost was \$4 per slot, with a smaller cost range (\$2 to \$5).

Larger programs generally had lower average costs than smaller ones. However, as program size increased, costs ratcheted up at critical thresholds - points where increased size required the addition of core staff capacity, such as an assistant director.

As noted, the cost of high-quality ELO programs serving elementary- and middle school children varies according to a number of factors, some of which are included in the following diagram:

Summary of Hourly Slot Cost Ranges by Program Type for School-Year Programs Serving ES/MS Children



²² This section relies heavily on Grossman (2009) and RAND (2011) which we view as the definitive studies on the cost to deliver high-quality ELO programs. The majority of the text in this section of our report is either taken verbatim from one of these studies or represents our synthesis of the data from both of these studies.

²³ For example, in-kind donations make up an average of one fifth of the total cost of quality ELO programming. "Mileage will vary."

Additionally, costs vary by geographic location due to different costs of living. Underlying all of the cost differences are explicit choices ELO programs make, mostly about staffing - staff/child ratios, staff certification, etc.

To simplify and bring up-to-date (2015 dollars) our discussion of the costs of high-quality ELO, we will use \$9-per-hour-per-slot as a reasonable estimate.²⁴

Based on our earlier discussion regarding the amount of high-quality ELO dosage needed to see improved child outcomes equates to an annual cost of about \$400 per child for one subject, \$800 per child for two subjects. However, in most instances, young at-risk children do not participate in ELO programs in such time increments. What is more common is "period-based usage." Two examples:

- A six-hour-per-day, five-days-per-week, five-week high-quality ELO program during the summer.
- A two-hour-per-day, four-days-per-week, nine-month-long high-quality ELO program during the school year.²⁵

Using our \$9-per-hour-per-slot cost estimate, delivery of the former program would cost about \$1,400-per-child while delivery of the latter program would cost around \$2,800.

RAND's 2011 study suggests a range of \$7 to \$14 per-hour-per-slot as the cost of providing high-quality ELO. Using the midpoint of that estimate and updating it to 2015 dollars results in an estimate of about \$12-per-hour-per-slot. The following table includes our two hourly cost estimates covering the scenarios presented above:

Source	Cost Per-Hour Per-Child	Minimum Time-To-Impact Per-Child	Minimum Time-To-Impact Per-Child	6 Hrs-Per-Day 5-Days-Per-Week 5 Weeks = 150 hrs	2 Hrs-Per-Day 4-Days-Per-Week 9 Months = 315 hours
		1 Subject 44 hours	2 Subjects 88 hours		
Grossman	\$9	\$400	\$800	\$1,400	\$2,800
RAND	\$12	\$500	\$1,100	\$1,800	\$3,800

There are many, many other possible scenarios regarding program features, hours spent in ELO programs, city vs. rural locations, setting, etc., but the table presented above should prove to be a good reference point for those wishing to estimate the costs of delivering high-quality ELO programs. It should be noted that in

²⁴ This accounts for 10 years of inflation (Source: CPI) since the \$7-per-hour-per-slot was calculated in 2005.

²⁵ The 150-hour and 315-hour scenarios reflect programs that are similar to typical summer ELO programs and afterschool education/care ELO programs respectively.

the 44-hour and 88-hour scenario, the total cost incurred is a relatively small percentage of public school per-child spending.

CONCLUSIONS

Recent research reinforces previous studies that the breadth, quality, intensity, and duration of high-quality ELO programs make a difference in the academic, social, and behavioral outcomes of at-risk children (Vandell, Reisner, & Pierce, 2007; Mahoney, Vandell, Simpkins, & Zarrett, 2009; Pierce, Bolt, & Vandell, 2010; Vandell, 2012; Li & Vandell, 2013; Auger, Pierce, & Vandell, 2013; Lee & Vandell, 2013). In order to achieve academic outcomes, ELO programs should focus on academics but not at the exclusion of socioemotional skills. The latter provide the psychological groundwork for the kinds of cognitive processes that are necessary for children to master academic content.

Because at-risk children often enter school well-behind their "not-at-risk" peers, the need for high-quality ELOs in the earliest school years is especially important. A significant body of research indicates that children who fall behind in school are likely to stay behind. High-quality ELOs can counteract at least some of this effect by offering programs before or after school and/or during the summer. If started as early as is practical - preferably at pre-k entry or at least in the earliest grades (K-3) - evidence shows these programs help reduce the achievement gap and, in the specific case of at-risk children attending high-quality pre-k, maintain and extend the academic edge they get from these programs into later grades. ELO programs can succeed with older children and the essential elements of these programs are basically the same as for younger children even though content will differ.

As with many education-based interventions, quality matters. In the case of ELOs, only high-quality programs have a significant impact on cognitive outcomes for at-risk children. Furthermore, research on high-quality programs show us specifically what elements ELO programs must have in order to succeed.

Demand for ELO programs substantially outstrips supply. The result is a need for more ELO programs/slots, more programs/slots operating at high-quality, and ways to make these programs more affordable for the families of at-risk children.

The per-child cost of high-quality ELO programs is relatively low compared to public school per-pupil spending. This is especially true for ELOs targeting specific subject (e.g., reading, math) improvement. At-risk children who are behind in these subjects need, at minimum, somewhere between approximately 45 and 90 hours of program time per subject - a little more than \$1,000 per-child.

There are three topics recommended for more/better research. First, the long-term impacts of ELO programs are not well-documented and it is unclear whether the positive effects of these programs stick beyond a few years. This evidence could be important in attracting funders to this space. Second, though reasonably easy for programs to calculate and track, the quality of the research base on ELO program dosage is weak and more/better research is needed with an eye toward establishing a "dosage taxonomy" (common definition of terms) followed by tighter estimates of various dosage/cost/outcome relationship. Finally, there is a need to identify and measure the effectiveness of more ELO programs as they scale and

at-scale. The field would benefit from a common understanding of which ELO programs are exemplars and program design and execution guidance these exemplars can provide.

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