

The TOP Early Learning Centers Longitudinal Study

Investigating the Process of Planning and Implementing an
Effective Early Childhood Evaluation

Prepared by the University of Kansas
Center for Public Partnerships and Research for
the Kansas Children's Cabinet and Trust Fund







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Over the past seven years, a Wichita preschool has engaged in a project unprecedented in Kansas early childhood education: tracking their graduates' outcomes throughout grade school and continuing to follow them through high school graduation.

More than 95% of school families consented to participate in this study, and two school districts provide ongoing information on these students and a demographically matched control group for researchers to compare outcomes. Results show that their elementary school-age graduates have lower placement in special education, fewer repeat discipline referrals, and higher state test scores – and they expect differences to become even more pronounced as the students progress through middle school.

The story of how this ambitious study came to be is largely the story of the school itself: Wichita's



The Opportunity Project, commonly referred to as TOP. Beginning in 2000, Wichita businessman Barry Downing and educator Janice Suzanne Smith spent three years researching the best strategies for significant and lasting change in their community. Of particular interest was the relationship between education and poverty. They focused in on early childhood education, recognizing quality early learning programs as critical for prevention of many long-term negative effects of poverty.

The first TOP Early Learning Center opened in 2003. Currently, three TOP Centers serve nearly 700 young children, preparing them for kindergarten and lifelong success. Since 2007, researchers at Wichita State University have been tracking TOP graduates as they progress through elementary and middle school to demonstrate TOP's effectiveness to a wide audience of stakeholders, including community members, business leaders, and policymakers. This rigorous evaluation provides an opportunity to analyze the return on investment associated with this innovative program which we present in this report.

TOP is partially supported by an Early Childhood Block Grant, and the school's dual commitment

to high quality early childhood education and results-oriented accountability is central to the mission of the Kansas Children's Cabinet and Trust Fund (the Cabinet). As outlined in the [Cabinet's Blueprint for Early Childhood](#), a significant component of collaborating to improve early childhood outcomes is tracking results and being able to demonstrate effectiveness.

This case study aims to make more visible a strategy for building a longitudinal study to serve as a model for others in the field. To do so, we draw on two stages of data collection and analysis. In the first stage, we read and analyzed all evaluation reports from the TOP Longitudinal Study, including supporting materials such as survey instruments and background information on TOP. Secondly, we conducted semi-structured interviews with individuals who participated in the development of TOP Early Learning Centers and the TOP Longitudinal Research Project. Interview data was analyzed for key themes as well as factual information about how the study was designed and conducted.

This case study will discuss the TOP model and describe the study and its results. We conclude by presenting four key features that make this study distinctive:

Excellent participation The TOP longitudinal study can boast an impressively high level of cooperation among families, teachers, schools, school administration and districts. 95% of all TOP graduates have consented to participate.

Targeted use of professional researchers TOP collaborates with WSU researchers on all aspects of the study, including design, data collection, and communication of the results.

Strategic approach to data The study employs a thoughtful approach to collecting and reporting on data which focuses on the key information needed to understand TOP's impact.

Commitment to demonstrating outcomes The study aims to produce convincing data that quality early childhood programs improve children's well-being – and doing so is considered to be essential to TOP's ability to continue, grow, and thrive as a program.

“Children in poverty must be ready to learn upon entering kindergarten. TOP is an effort to give children in poverty a high-quality early childhood education to have the biggest long-term impact. TOP gives children the right foundation they need to be successful in school, life, and career”

~Cornelia Stevens, Executive Director, TOP Early Learning Centers





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CREDITS

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About TOP Early Learning Centers

TOP is dedicated to brightening the futures of at-risk children by preparing them for success in kindergarten and beyond. TOP Early Learning Centers promote early education by reducing critical barriers facing working families in Kansas.

Our schools support working families by offering full and half-day learning opportunities to preschool age children. TOP provides a variety of fun learning activities to give these children the motivation and intellectual tools needed for emotional, academic and lifelong success. ~ TOP Early Learning Centers Website

Wichita's first TOP center opened in August 2003. Today, three Wichita locations serve nearly 700 children from birth to kindergarten. TOP Centers are strategically located in some of Wichita's lowest-income communities, serving many of Kansas's poorest children. There is currently a waiting list at all locations for all age groups. Families with infants typically get on the waiting

list early so their child can enroll in TOP by the time they reach one year of age.

Although there is no eligibility requirement for TOP enrollment, 92% of students qualify for free or reduced lunch, and the majority qualify for some type of state subsidy and/or scholarship dollars. Various funding streams support qualifying low-income families, including an Early Childhood Block Grant, Child Care Assistance, funding from USD 259 and USD 260, and Head Start and Early Head Start slots. Other families choose to pay for their child's enrollment in TOP because they want their child to experience a high-quality early education. These children make up about 8% of TOP enrollment.

THE TOP PRESCHOOL MODEL

TOP supports healthy, stable families and strong communities by providing low-income children access to affordable, full-day, year-round preschool. Public-private partnerships enable TOP to extend children's learning time in preschool, benefiting those children with the greatest needs. TOP is committed in their approach to early learning for two basic reasons. One, low-income



Research shows that quality preschool provides a number of benefits for at-risk children, immediately, throughout the teenage years, and into adulthood. Quality early learning:

- ★ Offers a safe and nurturing environment for children while parents work
- ★ Reduces special education placements in elementary school and beyond
- ★ Increases likelihood of graduating from high school
- ★ Reduces likelihood of being arrested for violent crimes
- ★ Reduces teen pregnancy
- ★ Improves employment outcomes and lifetime earnings

Additionally, preschool programs for children and families in poverty support job and economic growth for all.

families need opportunities that support increased levels of self-sufficiency, and two, low-income children need foundational skills for kindergarten readiness. The TOP model is built on the belief that if families' basic needs are met, stresses of life can be reduced or become more manageable, ultimately improving family and child outcomes. Safe and stable care is also believed to increase opportunities for parents to secure and maintain jobs.

Janice Suzanne Smith, Executive Director of the Kansas Children's Cabinet and Trust Fund and the original Executive Director of TOP, credits the preschool model's success in part to strong community partnerships and a commitment to assemble a variety of public and private entities for collaboration around serving low income children and families. "From the start, the TOP model took

a step back, allowing for partners to align their common missions and visions." This philosophical view of collaboration was pragmatic in approach, flexible, goal oriented, and understood that each community was going to be unique.

TOP prides itself on prioritizing creativity in their approach to early learning, strategically avoiding a "one size fit all" model. "The real emphasis is to try to have the best quality that you can with the resources and partnerships you have available and the creativeness to figure out ways of moving them along."

~ Janice Suzanne Smith, Executive Director, Kansas Children's Cabinet, Founding Executive Director, TOP

"A full-day, year-round classroom is a solution to providing at-risk children the environment and space they need to develop, moving them along the continuum of acquiring critical cognitive, social and emotional skills."

~Janice Suzanne Smith

In an attempt to bridge the education readiness gap of children in poverty, TOP focused on quality and relationship building at all levels. Ms. Smith noted that, "the highest quality standard among organizations was applied to all partners to achieve the best possible results with available resources." TOP's model is fluid in nature and responsive to community resources and the capacity of partners.

KEY FEATURES OF THE TOP MODEL

Community Collaboration and Partnerships

Creativity, Flexibility, and Responsiveness

Goal-Oriented and Solution-Driven

Commitment to High Quality Instruction

"This blend is driven by the understanding that we need to work together. Because we know that money drives quality and that programs for low-income children are under-funded, we need to pull from both public and private sources. TOP's model really looks at supporting families." A goal-oriented model solidifies continuous quality improvement at all levels. Once goals are achieved, new goals are set to address identified

gaps and improve services, making evolution a key characteristic of the model. For this reason, it's important to note that TOP looks different today than it did in its initial three years and will continue to adapt over time.

We know that children need support from stable families, healthy communities, and great teachers in order to thrive. TOP's blend of public and private resources have driven several notable collaborative efforts to promote successful educational outcomes for all students. The weaving of these unique partnerships into TOP's structure has enabled the organization to enhance the quality, availability, and accessibility of critical resources meeting the needs of low-income children and families.



The following partnerships demonstrate practical, problem-based solutions utilizing the key characteristics of the TOP Model. These partnerships demonstrate TOP's ability to be flexible, responsive, and creative when it comes to collaboration.

INNOVATIVE COLLABORATIONS

Rainbows United, Inc.

Rainbows United is a Wichita nonprofit that serves children with special needs. Rainbows provides on-site support to enhance the social, emotional, and behavioral development of TOP students. Their partnership with TOP enables access to mental health services in the classroom, addressing acute needs of children and families while providing support for TOP teachers and program staff.

GraceMed Health Clinic

GraceMed is a Wichita nonprofit, community health center. TOP has partnered with GraceMed to improve student access to health services, reaching many children and families who would otherwise be underserved. The partnership resulted in improved immunization rates and health outcomes among TOP students, while educating families about health and preventative care.

The TOP model insists on high quality instruction and a positive environment for both teacher and child. Essentially, TOP employs a “grow your own” philosophy, driven by the need for diverse staff serving a diverse population. Ms. Smith recounted that “early on, TOP wanted to be able to train teachers on the unique aspects of their curriculum to enhance teacher’s skills and knowledge.” TOP staff include state licensed teachers with bachelor’s degrees in elementary or early childhood education, unlicensed teachers with bachelor’s degrees in elementary or early childhood education, and staff with associate degrees in early childhood development. Because TOP leadership believes that a system of support and a development component are essential for providing opportunities and experiences necessary for good teachers, they have adopted a curriculum that is committed to staff development.

TOP students are the primary beneficiaries of TOP’s high quality instruction and curriculum. Structured activities and play create rich learning environments. TOP’s unique approach to early learning curriculum is evidenced by their Open Windows Learning Studios (OWLS). OWLS is TOP’s adaptation of the Reggio Emilia Approach, which is based on the principles of respect, responsibility, and community through exploration and discovery. This approach integrates arts and education to help preschool children expand their critical thinking skills. As Ms. Smith articulated, “OWLS allows for a more self-guided curriculum, where children take an active role in developing their curriculum. The child-directed curriculum helps children identify for themselves what they want to learn and what they have an interest in where the teacher is a co-collaborator in the children’s learning experience.” OWLS coordinators work with teachers to blend this instructional approach into their classrooms, and OWLS provides individual remediation for kids in the lower 10-20 percentile in literacy.



TOP: An Exemplary Program for Demonstrating Effectiveness

A critical component of collaborating to improve early childhood outcomes is tracking results to demonstrate effectiveness. The Kansas Children's Cabinet and Trust Fund is a strong proponent of rigorous evaluation practices and continuous quality improvement. The Cabinet's Blueprint for Early Childhood offers a vision of what success looks like, in broad terms and measurable goals while offering suggestions of specific measurement tools. TOP exemplifies this practice of rigorous evaluation and is proving that being able to track results and demonstrate effectiveness is necessary for:

- ★ assessing what's working and what needs improvement,
- ★ developing and maintaining community partnerships,
- ★ adapting to new challenges and creative problem-solving, and
- ★ maximizing available resources

Ultimately, demonstrating effectiveness is a fundamental pathway to creating meaningful change for vulnerable children.







TOP LONGITUDINAL STUDY

Methods and Results

Twelve years since its inception, the TOP model has demonstrated remarkable effectiveness and provides substantial savings to the State.

A recent cost analysis of TOP Early Learning Centers found that savings on special education placement alone yielded an 11% annual return on investment over the course of the students' education – approximately \$4.5 million.

TOP COST ANALYSIS

The Opportunity Project (TOP) uses public-private partnerships to deliver a high-quality early learning experience to children living in poverty. According to a cost analysis of **749 TOP graduates**:

33 FEWER TOP GRADUATES

were placed in K-12 special education programs compared to a control group

OF THESE 33:

3

MORE STUDENTS WILL GRADUATE HIGH SCHOOL ON TIME COMPARED TO THE CONTROL GROUP. **LIFETIME EARNINGS INCREASE: \$730,704**

7

MORE STUDENTS WILL ATTEND A 4-YEAR UNIVERSITY. **LIFETIME EARNINGS INCREASE: \$1,841,539**

5

MORE STUDENTS WILL GRADUATE FROM A 4-YEAR UNIVERSITY. **LIFETIME EARNINGS INCREASE: \$3,655,110**

RETURN ON INVESTMENT

Considering just the cost avoidance of Special Education Placement in K-12 of students enrolled at TOP for 2 years:

11%
ANNUAL
ROI

\$4.5 MILLION

SAVINGS OVER THE COURSE OF THE STUDENTS' SCHOOLING
OR **ALMOST \$500,000 / YR.**

Methods

TOP is able to demonstrate this kind of cost effectiveness due to the strength of the TOP Longitudinal Study. The study was designed to provide policy makers, business leaders, and other stakeholders evidence of TOP's effectiveness over the long term.

“Children who live in poverty and attend a high-quality preschool program experience primary and secondary effects that are long-lasting.”

Professor Emeritus Dr. Linda Bakken,
Principal Investigator,
TOP Longitudinal Study

WSU researchers issued the first annual report on the longitudinal study in 2009. Over the course of the next 6 years, these reports have demonstrated clear quantitative results. Using approachable language and methods designed to communicate to the layperson, the study investigates whether a high-quality early education program can improve life outcomes for children living in poverty. For instance, how much more likely is a TOP graduate to have better school attendance or exceed standards in reading and math than child who did not attend TOP? How do special education placement rates for TOP graduates compare to those of their peers? Data is collected on children beginning in kindergarten and annually thereafter. Additional cohorts are added every year. Currently, the study comprises 810 TOP graduates and a control group of 2,596 comparable children.

Because research demonstrates that a child's ability to behave appropriately the majority of the time in a school environment is predictive of his or her future capability to adjust later in life to the rules of society (Webster-Stratton, Reid, & Hammond 2004), the study is designed to capture both social-emotional skills and an array of school performance indicators. Data was gathered via teacher surveys and school performance data. Surveys ask teachers to compare the social skills of TOP graduates to the rest of their class.

Eligibility and Consent

The primary criterion to participate in the longitudinal study is eight months of continuous enrollment in the TOP program during the year preceding kindergarten entry. A consent form to participate in the longitudinal study is administered to parents or guardians. Consent covers a TOP graduate through elementary school. A second consent is obtained for middle and high school participation.

Teacher Survey

The social questionnaire asks teachers to compare the TOP graduates to the remainder of the children in their class in order to determine whether the TOP graduates used appropriate social skills more often than their peers. 12 questions address the three dimensions of social skills (four questions for each dimension) on a five point Likert scale:

- “1” if the child was in the bottom 20% of the class
- “2” if the child was in the bottom half of the class
- “3” if the child was about the middle of the class
- “4” if the child was in the top half of the class
- “5” if the child was in the top 20% of the class

WSU researchers average these scores for each dimension and divide each average by four to

determine how TOP graduates compared to the rest of their class overall. They then used t-tests to test if these average scores were statistically significantly higher than 3, the score that would indicate the children were typical for their class.

School Performance Data

WSU researchers compare TOP graduates' school performance data to a demographically-matched control group using descriptive statistics, including averages and percentages. School performance data include:

- Attendance
- Special education placement

- Repeat discipline referrals
- Cumulative grade point averages
- Reading proficiency
- Mathematics proficiency

Data Synthesis and Analysis

Since a primary goal of the study is to communicate with non-technical audiences such as members of the business community and policymakers, WSU researchers rely on straightforward and approachable methods of synthesis and analysis. The reports largely rely on descriptive statistics to report results.



Results

Social-Emotional Skills

For all grades, teachers rated TOP graduates as having greater emotional maturity, greater ability to behave appropriately, and greater social competence than their classmates. Teacher estimations of TOP graduates' social-emotional skills were statistically significantly higher than average.

Teachers perceived TOP children, on average, to be in the top 20% of the class in terms of appropriate behavior and social interactions. Scores do not erode over time, indicating a permanent shift in competent social skills.

Teachers perceived TOP students, on average, to be significantly more emotionally mature than their classmates, from K-5th grades, scoring in the top 30% of their classmates. Scores do not erode over time.

School Performance Data

For all grades, TOP graduates have noticeably fewer absences on average than their control group peers each year, from kindergarten through the 6th grade.

Among kindergartners, those who are TOP graduates attend school 2 more days in comparison to their control group peers.

When the Wichita and Derby school districts are combined, TOP graduates have a lower percentage of special education placement than their control group peers.

Compared to the control group, there were 33% fewer placements, overall, and in grades 4 through 6, 37% fewer special education placements among TOP graduates.

Discipline referrals were taken into account to determine behavioral problems. Only repeat office visits were a measure of discipline referral. When looking at the total numbers of kindergarten through 6th grade students, TOP graduates were much less likely to have discipline referrals.

TOP graduates are 44% less likely than their control group peers to have repeat discipline referrals.

TOP children in 4th, 5th and 6th grades have a considerably lower percentage of students who do not meet state standards in both math and reading compared to the control group.

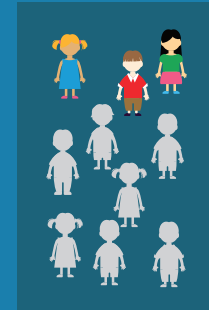
By 6th grade, 83% of TOP 6th graders meet or exceed state standards in math, compared to 50% for the control group.

In reading, 94% of TOP 6th graders meet or exceed state standards, compared to 76% for the control group.

TOP EARLY LEARNING CENTERS LONGITUDINAL STUDY

SOCIAL-EMOTIONAL SKILLS

TOP graduates ranked in the top 30% for **Emotional Maturity**, and the top 20% for both **Social Interactions** and **Appropriate Behavior**



SCHOOL PERFORMANCE

ABSENTEEISM - TOP graduates were absent 2 **FEWER** days than their classmates



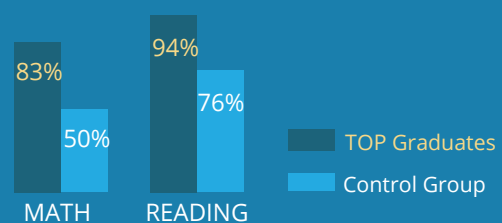
DISCIPLINE - TOP graduates were 44% **LESS** **LIKELY** to have repeat discipline referrals than their classmates



INTERVENTION - TOP graduates had 33% **FEWER** special education placements than their classmates



ACADEMICS - TOP graduates were significantly **MORE** **LIKELY** to meet math and reading standards

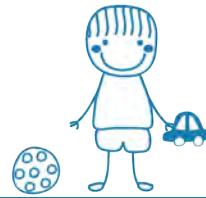






DISCUSSION

Key Features and Lessons Learned



4 Key Features of the TOP Longitudinal Study

After interviewing the key players who have developed and conducted this ambitious study, and reviewing all reports and instruments, we have identified four key features that make this study distinctive. They are:

- ★ Excellent participation
- ★ Targeted use of professional researchers
- ★ Strategic approach to data
- ★ Commitment to demonstrating outcomes

Key Features

1. Excellent Participation

The TOP longitudinal study can boast an impressively high level of cooperation among families, teachers, schools, school administration and districts, including:

- 95% of all TOP graduates
- 99% of the most recent cohort
- 99% of teacher surveys completed
- Two school districts covering 72% of eligible TOP graduates

Over time, family participation rates have increased dramatically. In 2009, 59% of the cohort parents' consented to study participation. To improve participation rates, TOP staff made a simple, but effective change: they shifted the timing of the ask. Initially, staff asked for parental

consent as graduates were leaving TOP for kindergarten entry. Asking for consent as parents were enrolling children into TOP produced much higher rates of participation. TOP staff noted that because parents were already there in person for enrollment and signing paperwork, it was much easier to fold in yet another form. Moreover, they felt appreciative and excited that their children were going to attend TOP, and were pleased to be able to do something to give back to the organization.

Parents were provided with a longitudinal study brochure explaining the premise of the study. TOP program staff noted that generally the only families who do not give consent were guardians of foster children. In order to keep current TOP graduate and parent contact information, TOP staff send out reminder postcards annually,

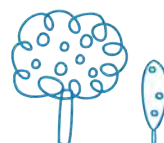
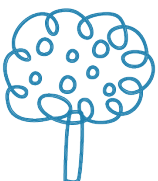
and maintain a Facebook page to reach out to parents.

Family consent was only half the battle. In order to collect data for the study, school districts' and teachers' willingness to cooperate was crucial. School systems' central offices provide school performance data, locate a child within the school district, and identify the principal and teacher for each TOP graduate. Due to relocation, they sometimes do this as many as three times a year for the same student. WSU Professor Emeritus Dr. Linda Bakken, the principal investigator, described schools as "fantastically cooperative."

TOP staff noted that communication is key to this relationship. TOP built relationships with school districts, schools, teachers, and administrators, educating them about the goals of the study and why it was important to their overall mission. As a result, Dr. Bakken observed that school districts understood and agreed with the, "premise of the study. Educators saw the value of early childhood education, and the importance of early intervention...getting to children early in terms of development and school readiness."

The central public school administration was key to participation. TOP placed a strategic focus on superintendents to gather teacher surveys and demographic data for TOP study participants. Changing the accountability of gathering survey information directly from teachers to the principals lessened the administrative load on TOP staff. Although school faculty and administration generally recognized the value of the study, as busy professionals they still needed prompting in the form of phone calls and emails to gather the data. Principals and teachers were both rewarded for their participation in the evaluation process with gift cards.

Teacher participation has also been excellent. One TOP staff stated that teachers want more TOP children in their classrooms because of their readiness for school. In addition to education and incentivizing participation, WSU researchers have worked to make the teacher survey less cumbersome, so it takes less time for them to complete. Over time the format was altered and eliminated any redundancy in questions, condensing a three-page survey into a one-page survey that takes teachers less than 10 minutes to complete. Revision of the longitudinal study allotted for the 12 question survey addressing the three dimensions of social skills integral to



the TOP curriculum. By changing the format of the survey, data produced the same answers with fewer questions.

2. Targeted Use of Professional Researchers

A second key feature of the TOP study is the targeted use of professional researchers. Rather than simply handing over the reins of the project to WSU researchers, TOP has collaborated with them on the design, data collection, and communication of the results.

WSU researchers were particularly important at the design stage of the study. With input from TOP, they developed the evaluation plan and identified outcomes that were grounded in the literature and would be possible to replicate in this study. They came up with a workable strategy for having a comparison group to act as a control. They created and revised the surveys. Finally, they collect data and conduct all analyses on an annual basis.

Much of the work gets done through extensive collaboration between WSU researchers, TOP staff, and school administrators. TOP staff do a significant amount of legwork, including getting consent from all the families, and relationship building and maintenance with the school districts. They keep in contact with the families and keep current on contact information. WSU researchers deal with all aspects of fielding the teacher survey – getting in touch with the teachers, sending out and collecting surveys, arranging teacher compensation, and

working with school administrators.

Even the reports are fundamentally shaped by TOP. Dr. Bakken stressed that she worked closely with Mr. Downing to create a report that was less academic and more compelling to laypeople, business people, and legislators. This meant avoiding use of inferential statistics, and instead focusing on descriptive statistics which could be immediately understood and appreciated by a non-technical audience.

There are multiple benefits to this approach of using professional researchers in targeted ways. It seems to create a nice collaborative relationship in which the researcher is closely working with staff to ensure she is producing something useful to them. There are obvious cost savings. Finally, it may be part of their ability to achieve excellent participation: families and school districts may be more inclined to participate in a study when approached by an excellent local preschool, rather than a previously unknown university researcher.

Still, TOP worked with professional researchers at the crucial points. WSU expertise was key to designing the study and identifying key research-based outcomes to track. WSU researchers and TOP staff designed the surveys. And, of course, the researchers collect the data, conduct the analyses, and write the reports. Collaborating with researchers on design and analysis utilizes their expertise to produce a higher quality product,



taking advantage of their understanding of research and instrument design, and the depth and breadth of the scholarly literature on early childhood. TOP maximized the professionalism of this project by including researchers the way it did, while still distributing many tasks associated

“It was important to keep the study as rigorous as possible while also framing data in a way that would be relevant to outside entities.”

—
Professor Emeritus Dr. Linda Bakken,
Principal Investigator,
TOP Longitudinal Study

with this project that could be done as well or better by TOP staff.

When asked whether a smaller or more rural program could get away with not employing a professional researcher to work on a project such as this, TOP staff suggested they could imagine using researchers just to design a study that laypeople could conduct (say, without conducting any analysis), which a program could then follow indefinitely. In this scenario, it would be wise to periodically consult with a researcher, as even the most carefully designed research project needs to be adapted over time to changing conditions.

3. Strategic Approach to Data.

A theme throughout our interviews with TOP staff and WSU evaluators is that there has been a consistent focus on not collecting and reporting every possible thing they could, but rather focusing on the key information needed to understand TOP's impact. This strategic approach to data collection and reporting highlights the at least two ways that extraneous information can be problematic. First, data or analyses that are not strictly necessary to convey the point of the project are a waste of effort. This is important for TOP staff, who have other things to do besides collect data. It's also important in the context of the partnerships with school districts: a targeted approach signals respect for the time and effort of school administration, staff, and faculty. Second, being selective about what data are presented is key to communicating to a broad audience. TOP staff, and Mr. Downing in particular, have focused on outcomes that will persuade policymakers, potential investors, and the public. Anything additional risks distracting attention from TOP's successes, garbling the real message, redirecting attention to less important outcomes of TOP, and even attracting undue skepticism.

TOP staff described many instances in which this strategic approach guided decision making. One was the revision of the teacher surveys to get the same amount of information in fewer questions. A second instance is the decision to report the characteristics of cohorts, rather than individuals. Study researchers are following individual children, which is how they are able to collect data on them year to year. However, individual characteristics of the children, such as race, gender, socioeconomic status, or tenure at TOP, are not taken into account in the analyses.

While the study does not report on every possible characteristic of these children, this means that estimates are likely conservative. The difference between children who attended TOP and those who didn't would likely be more pronounced if individual characteristics and changes in cohort composition were taken into account. And, there are clear benefits to this simpler approach. It simplifies data collection greatly, and likely makes it easier to get district and teacher cooperation. Furthermore, it may be true that including individual-level variables is just not that important to persuading others – it might even look to the layperson like trying to lie with statistics.

A third example of the strategic approach to data is the decision to follow the children in two school districts rather than try to follow all TOP graduates. Mr. Downing's original goal was that any child who was eligible to be part of the study would be tracked throughout the Kansas school system. This turned out to be overly cumbersome. It was very difficult to check all the school districts in the state to track study participants who had moved out of Wichita. After the third year of the project, they limited the study to Derby and Wichita school districts. Limiting the study to these two districts captures the vast majority of TOP graduates, and allows staff to focus their efforts on getting excellent participation rates.

There are multiple benefits to this strategic approach to data. First, it offers necessary focus: on the goals of the project; on respecting time and effort of partners and staff; and finally, on the intended audience. This is not a study designed to sit on a shelf; it's a study designed to persuade laypeople about the value of high-quality preschool.

Second, a strategic approach to data has offered staff and evaluators the flexibility to change what's not working, or could be working better. Examples include the willingness to streamline the teacher survey, and to focus on two school districts rather than following every TOP graduate around the state.

Finally, it's effective. This study may not have succeeded if TOP hadn't been so selective about what to collect and present. It made this project fundamentally manageable – which in turn allowed it to be exceptional.

4. Commitment to Demonstrating Outcomes

The final key feature ties everything else together: demonstrating outcomes is a central value of this organization. Being able to track and demonstrate effectiveness was always a secondary goal of TOP. When Mr. Downing and Ms. Smith started TOP, they expressly planned to be tracking children's outcomes over the long term from the beginning – it was always a secondary goal of the school, essentially baked into the operation. The value of doing so seems self-evident to every person we spoke to: all perceived that continued support of TOP is dependent on being able to show long-term results on issues the public cares about.



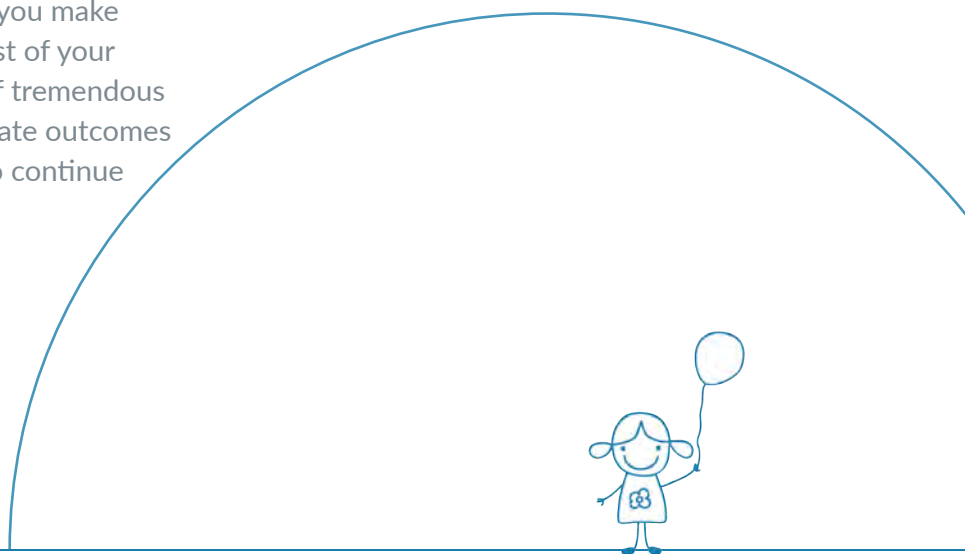
The study aims to produce convincing data that quality early childhood programs improve children's well-being – and doing so is considered to be essential to TOP's ability to continue, grow, and thrive as a program.

This level of commitment to demonstrating results can be rare in the world of early childhood services. Many early childhood program staff worry that evaluation takes time and money away from the real work of the organization – the work that will directly benefit children. In a context in which everything is tight – time, money, expertise – and the need is vast, growing, and desperate, it can be difficult to justify directing resources towards evaluation.

However, the fact remains that without a method of tracking the outcomes of your program, your belief that you are helping kids is based on your own experiences and intuition, which are heavily colored by your personal biases. In a world in which demand is great and resources are limited, it is crucial that programs be as effective as they can be in helping their target populations. This requires tracking outcomes continuously, systematically weighing the evidence, and continuously looking for ways to improve. Evaluation is part of how you make sure you are helping kids to the best of your ability. Furthermore, in a context of tremendous skepticism, being able to demonstrate outcomes is your best chance at being able to continue

helping kids, and even expand your efforts to help more.

TOP's commitment to demonstrating outcomes is really at the heart of everything that makes this study special. It's responsible for the ambitiousness of the project – they are tracking all of the kids they can, for as long as they can, because they believe that their program is good enough to yield long-term results, and they want others to see it. It's responsible for the numerous instances of creative problem-solving they've employed along the way: roadblocks are not seen as a reason to give up or scale back, but rather challenges to be overcome. Finally, it's resulted in a willingness to ask. They are willing to ask districts, teachers, and parents for their cooperation and time because they think this project is important. They also think that TOP is yielding benefits for these groups, so they should also want to help it and demonstrate its value.



Lessons Learned

Take the time to develop relationships. A recurring theme in the story of this project is the strength of TOP's partnerships. These relationships have been fundamental to carrying out such a large-scale study.

Be transparent. Let both partners and participants know exactly what you are studying and why. It will be vital to both recruitment and participation, and will ultimately improve data quality.

Don't be afraid of change. Too often, we feel stuck within the confines of our previous decisions. A key strength of the TOP study has been the willingness to acknowledge what isn't working and fix it. Be pragmatic in your choices and flexible in response to new information.

Allow for your study to expand. Programs and populations change over time; so, too, do the goals of research. Periodically review your research design to determine whether you're really getting what you need to make decisions and inform others.

Be persistent about tracking procedures. The TOP Longitudinal Study has achieved such high participation rates across levels by continually asking and following up.

"However long you think it will take, double it." Data collection and analysis are rarely efficient and linear processes. Do your best to plan efficient methods of collection and synthesis, but know that no one gets everything right the first (or second, or third...) time.

Go big! Small additional investments in evaluation can yield large returns in terms of impact. The results of this study are exceptionally useful and compelling because of the scale of the project.

Keep your eyes on the prize. TOP staff, evaluators, and school faculty and administration are all committed to the value of early education, and the power of demonstrating its impact. Your research should be motivated by the same goals that guide your work: improving the lives of at-risk kids.





APPENDIX

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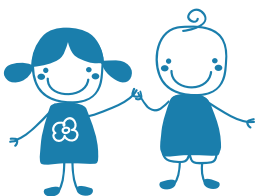
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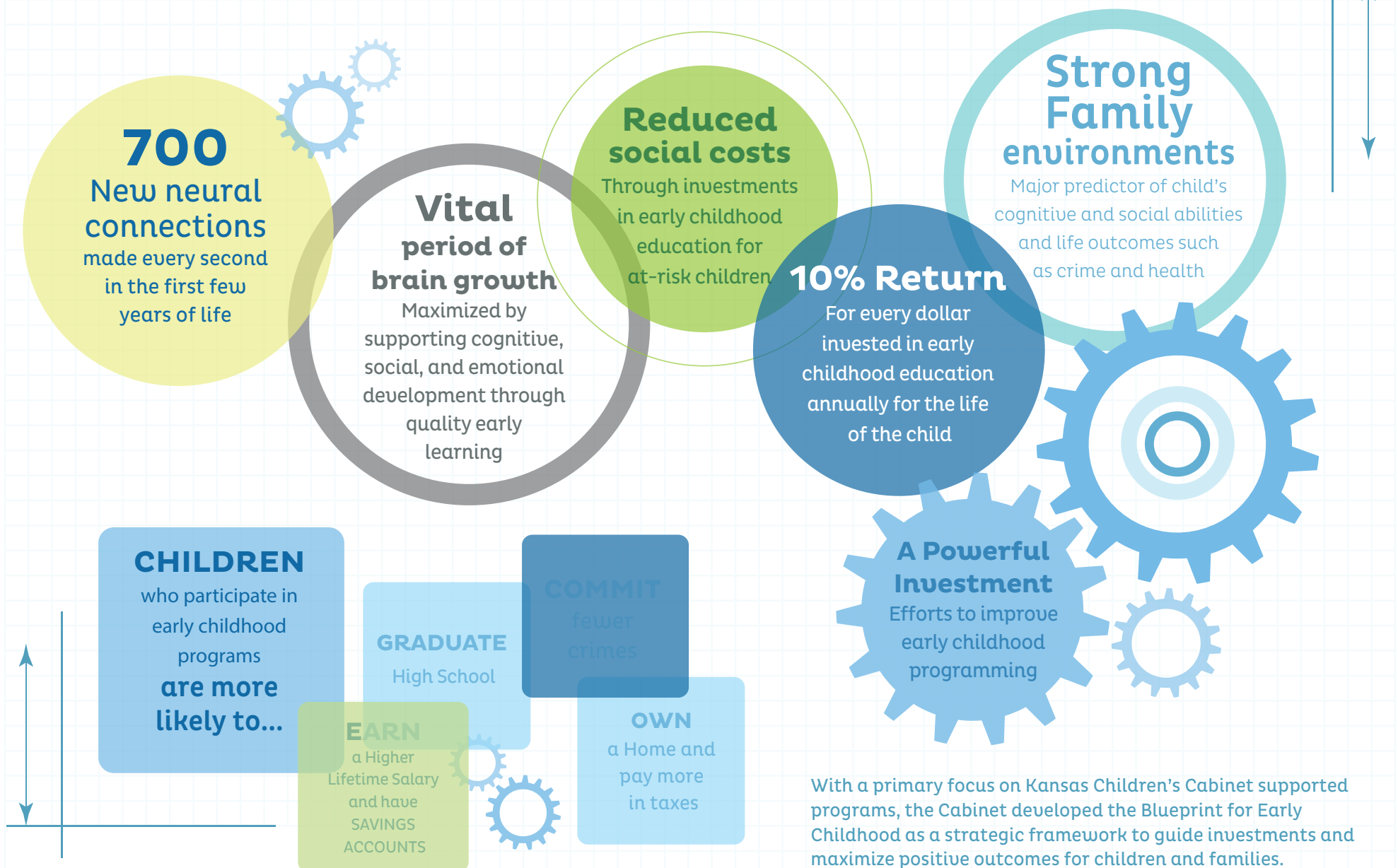
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Investing in the Future of Kansas

Healthy Development, Strong Families, Early Learning



Sources: Center on the Developing Child (Harvard University), Partnership for America's Economic Success, Pew Center on the States, The Heckman Equation, ReadyNation

What is the Blueprint for Early Childhood?

Building a Strong Foundation for Children and Families

An expression of the Kansas Children's Cabinet and Trust Fund's vision for early childhood in Kansas, the Blueprint for Early Childhood ("Blueprint") is a strategic framework to optimize child and family well-being. The Blueprint will be used to align the Cabinet's investment portfolio and monitor progress toward goals.



"Often the most powerful change comes from the community level and develops from the alignment of stakeholders working together in a coordinated way."

- Amanda Adkins, Kansas Children's Cabinet and Trust Fund Chair



Implementation

Built on past systems' work, the Blueprint is a forward-looking guide for expanding an effective early childhood system of services and supports for young children and their families.

Areas of Impact

The Cabinet identified Areas of Impact within each of the Building Blocks – Healthy Development, Strong Families, and Early Learning that aim to unite past and current collaborative work products.

Current Measures

The Cabinet is committed to a system of shared measurement and strong accountability to tell the story of early childhood investments in Kansas. Common measures are the tools currently being used to measure short-term and intermediate outcomes in Early Childhood Block Grant (ECBG) and Community-based Child Abuse and Neglect Prevention (CBCAP) programs.

Community Collaboration

Moving the needle on Healthy Development, Strong Families, and Early Learning will require creative community collaboration across sectors, involving multiple partners working toward a shared vision of high quality, accessible, affordable programs for young children and families.

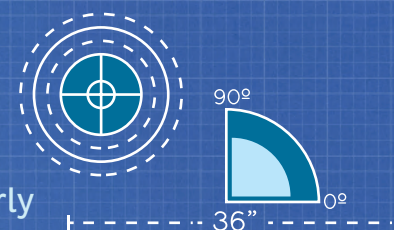
What Do Healthy Development, Strong Families, and Early Learning Look Like?

While the path to achieve success may vary, the Cabinet's vision of success is intended to serve as a guide for innovative program design, partnership development, implementation and tracking toward long-term outcomes for children and families.

Blueprint for Early Childhood

Building a Strong Foundation for Children and Families

The **Kansas Children's Cabinet and Trust Fund** recognizes early childhood as a critical period of intervention that establishes a child's foundation for school and life success. We are therefore committed to nurturing a culture of public-private partnerships in early childhood programming where diversity of thought is an asset and past work is valued.



Goals

public-private
Partnerships

Community Collaboration
shared vision

Healthy Development

PRIMARY CARE

SOCIAL-EMOTIONAL DEVELOPMENT

EARLY IDENTIFICATION

Child

AREAS OF IMPACT

Ensure outreach, education, and ongoing support for pregnant women (particularly underserved populations)

Promote early and comprehensive prenatal care

Increase identification, access/availability and quality of services

Increase insurance coverage for pregnant women and children

Support all children in having a medical home

Promote access to oral health and vision care

Integrate and screen universally for healthy development

Improve access to mental health services through partnerships

Promote inclusion of children with disabilities into natural environments

Promote public-private partnerships

Strong Families

PARENT SUPPORT

SAFE, STABLE AND NURTURING
RELATIONSHIPS (SSNRs)

COMMUNITY ENGAGEMENT

Family

AREAS OF IMPACT

Support parent involvement and leadership

Promote safe, stable, and nurturing relationships to ensure children have strong, healthy starts

Promote cross-sector partnerships to support comprehensive needs of families

Engage non-traditional stakeholders

Promote, evaluate, and enhance evidence-based family support programs

Promote the facilitation of peer-to-peer support opportunities

Promote opportunities for families to earn a living wage

Promote public-private partnerships

CHILD CARE

PRE-K

EARLY LITERACY

Educational
Environment

AREAS OF IMPACT

Promote community-based, school-based, and faith-based early learning experiences

Support economic development of child care businesses

Ensure high-quality care for all children by promoting adequate funding for core services

Ensure high-quality care for all children by supporting the implementation of a statewide quality rating and improvement system

Promote effective transitions into school for at-risk populations, including voluntary, full-day kindergarten

Support inclusive and culturally sensitive training for early childhood professionals based on established core competencies

Support the use of early learning standards to increase consistency and quality of services

Promote public-private partnerships

As a baseline for this Blueprint, collaborative work products in which the Cabinet has participated, such as the Kansas Early Childhood Comprehensive System Plan, the Kansas School Readiness Framework, and the Kansas Strengthening Families Plan, have been used. Existing plans such as the Governor's Roadmap for Kansas, the Maternal and Child Health Strategic Plan (KDHE), the Child Care and Development Fund State Plan (DCF), and the Kansas Head Start State Collaboration Office Priority Areas (DCF) will also continually inform the Blueprint to support collective impact.



Healthy Development

WHAT DOES HEALTHY DEVELOPMENT LOOK LIKE?

Child

Pregnant women have access to prenatal care

Infants are born at adequate birthweight

Mothers breastfeed at least 6 months

Children are current with immunizations

Children reach developmentally appropriate milestones

Early childhood professionals have specialized early childhood mental health training

COMMON MEASURES*

Ages and Stages Questionnaire (ASQ) - 3

ASQ: Social-Emotional

Devereaux Early Childhood Assessment (DECA) I, (DECA) T, (DECA) P2

Individual Growth & Development Indicators (IGDI), myIGDI

COMMUNITY COLLABORATION

Businesses	Foundations
Child Care	Local Health Depts
Community Orgs	Medicaid
Faith-Based Orgs	Mental Health Centers
Families	State Agencies
Family Supports	Other

Strong Families

WHAT DO STRONG FAMILIES LOOK LIKE?

Family

Fewer children live in poverty

Families can afford child care

More children are born to mothers with a high school diploma or more

Family support programs are able to meet the demand for services

No children experience abuse or neglect

COMMON MEASURES*

HOME Inventory - Infant/Toddler

HOME Inventory - Early Childhood

Keys to Interactive Parenting Scale (KIPS)

Protective Factors Survey (PFS)

COMMUNITY COLLABORATION

Businesses	State Agencies
Community Orgs	Universities
Faith-Based Orgs	Other
Families	
Family Supports	
Foundations	

Early Learning

WHAT DOES EARLY LEARNING LOOK LIKE?

Educational Environment

Child care facilities & homes are able to meet the demand for services

Early learning programs are able to meet the demand for services

Programs are compliant with licensing regulations

Early learning programs are high quality

Early childhood professionals are competent, credentialed, and effective

COMMON MEASURES*

Devereaux Early Childhood Assessment (DECA) I, (DECA) T, (DECA) P2

Classroom Assessment Scoring System (CLASS) - Toddler

CLASS Pre K

Individual Growth & Development Indicators (IGDI), myIGDI

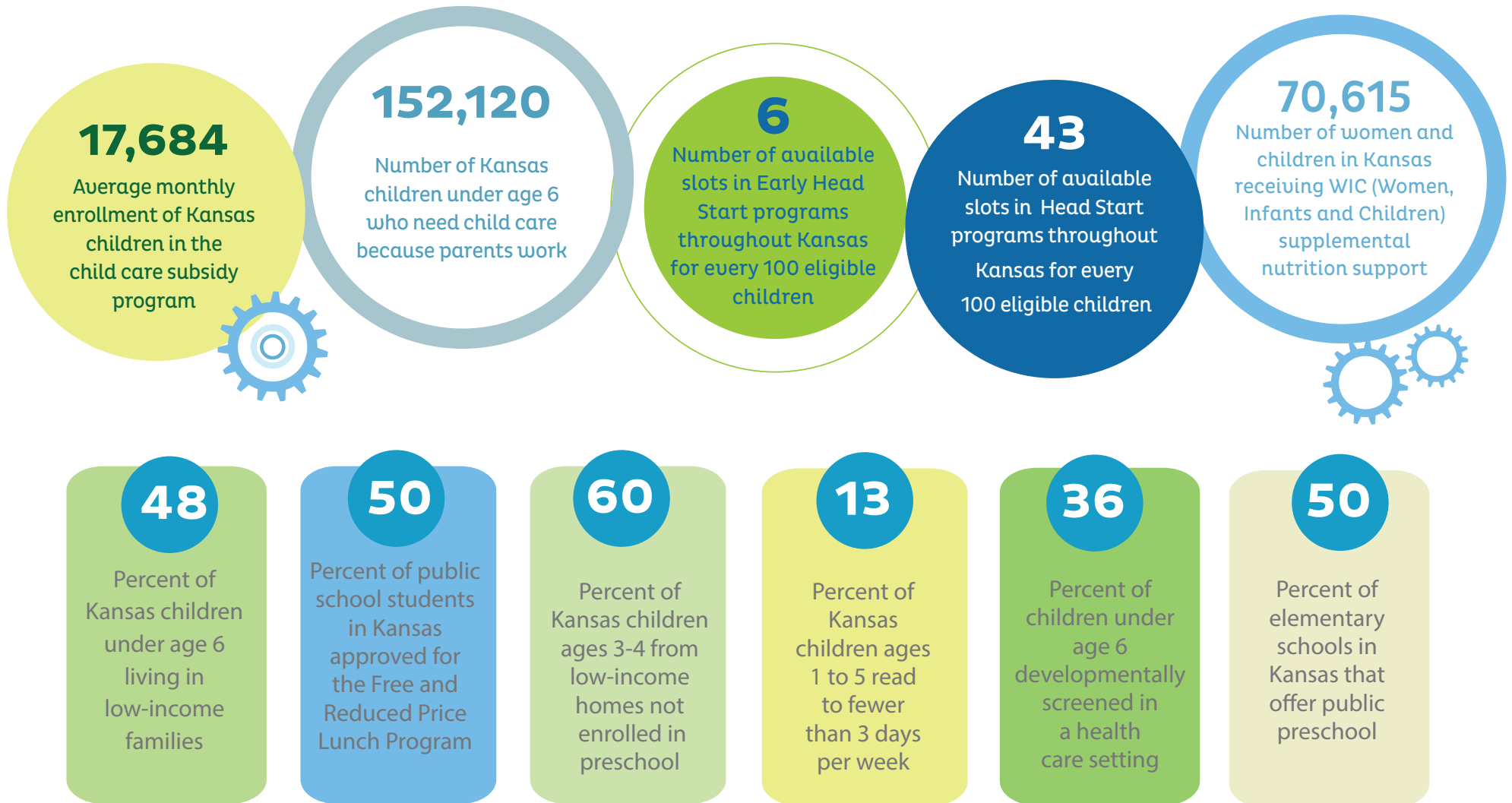
COMMUNITY COLLABORATION

Businesses	Foundations
Child Care	Health Professionals
Community Orgs	Libraries
Faith-Based Orgs	Pre-K Programs
Families	State Agencies
Family Supports	Other

*These common measures are currently used by Cabinet-funded ECBG and CBCAP programs. All Cabinet-funded programs are invited to use these measures.

Why Does Kansas Need Investments in Early Childhood?

Building a Strong Foundation for Children and Families



Sources: Child Care Aware of Kansas, Kids Count Data Center, The Heckman Equation, U.S. Department of Labor, U.S. Department of Agriculture

About TOP



The Opportunity Project (TOP) is a charitable organization devoted to the early education of children living in poverty. We believe that all children can learn, regardless of their economic status. TOP, along with its numerous public and private partners, is dedicated to offering the very highest educational opportunities to children 1-5 years of age.

TOP seldom charges tuition at its three state-of-the-art facilities. Families who can demonstrate low-income status must simply commit to ensuring their children attend TOP at least 85% of enrolled hours and participate in their children's learning journeys.

TOP assists parents in creating the best environment for their children. Parenting classes are available, social service referrals are made and health professionals offer sight, hearing and general health assessments (often on site). TOP staff members work with parents to help them create family improvement plans so they can better their home lives.

National longitudinal studies prove that a high-quality early educational experience, at a center such as TOP, dramatically improves children's chances of having successful life outcomes. These children are more likely to graduate high school, attend college, get a job, and stay out of trouble later in life.



Oaklawn Neighborhood
Est. 2003



I-135 Corridor
Est. 2006



Evergreen Neighborhood
Est. 2011



EARLY
LEARNING
CENTERS

Our Model

- ★ Full day/full year classes for children ages 1-5
- ★ Low student/teacher ratios
- ★ Evidence-based literacy curriculum for k-readiness
- ★ Language & literacy remediation with focus on phonemic awareness
- ★ Open Windows Learning Studios (OWLS) for scientific investigations & critical thinking
- ★ Licensed/degreed/certified teachers (AA, BA)
- ★ Parental involvement & support
- ★ Social & health services referrals
- ★ Two meals & snacks each day
- ★ Learning delay testing & remediation

Financial assistance for those who qualify.



Our mission is to deliver a high-quality early learning experience to children living in poverty, providing them the tools needed for emotional, academic and lifelong success.


Measured Outcomes For Kindergarten Readiness



At the beginning and end of each school year, four and five-year-olds at TOP Early Learning Centers participate in Pearson Work Sampling System assessments - a nationally recognized assessment used to individualize instructions, communicate with families more effectively, and measure students' outcomes.

Teachers observe and collect data on each of the children during the assessment periods. Broad categories observed include: Personal and Social Development, Language and Literacy, Mathematical Thinking, Scientific Thinking, Social Studies, Physical Development and Health, and the Arts.

The table below shows the percentage of four and five-year-old children proficient in five key areas of measurement at the end of the school year. It also shows the percentage gains from the beginning to the end of the 2014-2015 school year.



Measure	2014-2015 Proficiency	8-9 Month Proficiency Gain
Mathematical Thinking	82%	64%
Language & Literacy	84%	59%
Social Development	89%	58%
Scientific Thinking	86%	70%
Social Studies	83%	62%

Longitudinal Study Results 2008-2014 (876 TOP students)



Social Skills

- ★ Appropriate Behavior – TOP grads are within the upper 20% of their classes
- ★ Competent Social Interactions – TOP grads are within the upper 20% of their classes
- ★ Emotional Maturity – TOP grads are within the upper 30% of their classes

Absenteeism

- ★ Ranges from a 17% less likelihood of being absent from school in kindergarten to 31% in seventh grade

Special Education

- ★ Overall, TOP grads are 36% less likely to be in special education than their peers

Repeat Discipline Referral

- ★ Combining all grades, TOP graduates are 46% less likely than the Control Group to have repeat discipline referrals

Grade Point Average (7th grade)

- ★ By seventh grade, on average, TOP graduates have a GPA of 3.07 compared to the Control Group's 2.80 GPA

Academics

- ★ TOP graduates in 3rd through 7th grades combined have a lower percentage of students who perform at Level 1 (student is not consistently at grade level) in math and reading compared to the Control Group
- ★ By 7th grade, 82% of TOP graduates rank at Level 2 (student is performing on grade level) or higher in math compared to 69% of the Control Group
- ★ In reading, 71% of TOP 7th graders rank at Level 2 (student is performing on grade level) or higher compared to 58% of the Control Group

TOP COST ANALYSIS

Technical Report

Introduction

At the request of the Kansas Children’s Cabinet and Trust Fund, the University of Kansas Center for Public Partnerships and Research (CPPR) conducted a cost analysis of The Opportunity Project (TOP) Early Learning Centers. The following pages offer the results of that analysis, and the full methodological details of how we calculated cost savings and return on investment associated with TOP, including:

1. the cost of educating students at TOP
2. the cost of typical early care
3. the difference between the cost of TOP and the cost of typical early care
4. the effect of TOP on special education placement in elementary school
5. the cost of special education placement
6. short-term outcomes for students placed in special education
7. long-term outcomes for students placed in special education

The description below details all calculations, assumptions, data sources, and sources for estimates from the literature.

Results

<i>Cost of typical care in Sedgwick County</i>	
Cost of a child receiving home-based care for 2 years	\$11,216.92
Cost of a child receiving center-based care for 2 years	\$14,395.68
<i>Cost of TOP</i>	
Cost of a child attending TOP for 2 years	\$14,664.76
Cost to educate all 749 TOP graduates in study	\$10,983,905.20
<i>The premium for high-quality care</i>	
Cost to educate 749 children in typical care for 2 years (half home-based, half center-based)	\$9,590,329.32
Difference between the cost of typical care and TOP (749 children)	\$1,393,575.88
<i>Special education: immediate costs</i>	
Number of TOP children that would have been placed in special education, but were not (based on outcomes for the control group)	33
Additional cost associated with educating a child in special education in Wichita and Derby	\$14,502
Cost of educating 33 children in special education for one year	\$478,555
Cost of educating 33 children in special education for 11 years	\$5,264,110
Savings on special education placements	
Return on investment (11 years)	
\$4,475,458.73	
277%	
<i>Special education: impact on educational attainment</i>	
Based on the most recent estimates, of the 33 children that were not placed in special education:	
• 3 more will graduate high school on time	
• 7 more will attend a 4-year university	
• 5 more will graduate from a 4-year university	
<i>Special education: impact on earnings</i>	
In the first 8 years out of high school, young adults placed in special education earn on average \$1 less per hour than young adults who were not.	
Annual earnings difference between the two groups	\$16,000
Earnings difference over these 8 years for these 33 young adults	\$528,000
Difference in lifetime earnings (25-64) for the 3 additional children to graduate high school	\$730,704
Difference in lifetime earnings for the 7 additional children to attend college	\$1,841,539
Difference in lifetime earnings for the 5 additional children to graduate college	\$3,655,110
Total difference in lifetime earnings	\$6,755,353

1. Calculating the cost of educating students at TOP

Data source: annual expenditures data provided by TOP (“TOP Early Learning Centers Expenditure by Year”)

We used TOP’s 2010 total annual budget to calculate the cost of attending TOP. Although more recent expenditure data were available, 2010 provided an appropriate lag to capture the costs of educating many of the children attending elementary school in the 2013-2014 academic year, the year for which the most recent evaluation data were available.

Total annual budget, TOP South and North (2010) = \$3,226,245

We began by calculating cost per classroom. According to TOP staff, there are equal numbers of teachers in each classroom. We assumed that other items listed in expenditures were evenly distributed across classrooms as well:

- Food service
- Utilities
- Repairs and maintenance
- Depreciation
- Classroom materials and supplies
- Other expenses

Therefore, we estimated the cost per classroom as the total annual budget divided by the number of classrooms. TOP staff advised that there are 22 total number of classrooms in TOP South and North.

Annual cost per classroom = Total annual budget/number of classrooms

Annual cost per classroom = \$3,226,245/22=\$146,647.5

The maximum number of children in a classroom varies by age. The maximum number of children ages 1-2 years is 16 per classroom; the maximum number of children ages 3-5 years is 20 per classroom. Both for the sake of simplicity and because TOP staff have indicated that it is generally the case, we assumed all classrooms to be filled. Therefore,

Annual cost per year per child aged 3-5=Cost per classroom/20 children

Annual cost per year per child aged 3-5=\$146,647.5/20=\$7,332.38

Annual cost per year per kid aged 1-2=Cost per classroom/16 kids

$$\text{Annual cost per year per child aged 1-2} = \$146,647.5 / 16 = \$9,165.47$$

TOP's evaluators do not collect information on how long children attended TOP before progressing to elementary school. The minimum time required to participate in the study is 8 months, and children must have attended TOP the year immediately preceding kindergarten. However, it seems fair to assume that most of the 749 children in the 2013-2014 report attended TOP longer than the minimum time required to participate in the study. TOP accepts children as young as 1 year old, and depending on the timing of their birthdays, Kansas children can enter kindergarten as late as 6 years old, making the maximum time a child could attend TOP 5 years.

Current data indicate that the mean time TOP students attend TOP is about 1.5 years. Modal values indicate that more than half of 4 and 5 year olds currently attending TOP will do so for one year or less, and over 80% will have attended TOP for 2 years or less. Based on this information, we chose to use 2 years as a conservative basis for calculating the cost of educating a TOP student. We estimated the typical trajectory of a TOP graduate to include the annual cost per child age 3-5.

$$\text{Typical cost per TOP student} = \text{cost of child attending TOP 2 years} = (\text{annual cost per year per kid age 3-5}) * 2$$

$$\text{Typical cost per TOP student} = 2 * (\$7,332.38) = \$14,664.76$$

2. Calculating the cost of typical early care

It is likely that the vast majority of children who attend TOP would otherwise be placed in another paid care arrangement. Therefore, it is appropriate to contextualize the cost of educating a child at TOP by comparing it to the cost of typical child care. We used estimates for the weekly cost of child care in Sedgwick County from Child Start:

Data source: <http://www.childstart.org/CCRR/cost.html#Sedgwick>

This website divides estimates by family child care and child care centers, and by the age of the child. Estimates for the weekly cost of care in Sedgwick County are partially reproduced below:

Age group	average
Family Child Care	
2 Years	\$112.43
3 Years	\$110.63
4 Years	\$109.59
5 Years	\$106.12
Child Care Centers	
2 Years	\$157.11
3 Years	\$145.38
4 Years	\$144.23
5 Years	\$132.61

According to TOP's website, TOP runs year round, so comparative cost per child in typical care should be for a full year. To maintain parallel calculations with the estimate for educating a child at TOP, we incorporated the costs of child care for a 4 year old and a 5 year old for one year each to estimate the cost of two years of care. Although child care providers generally close for holidays and breaks, this time off is usually paid. Therefore, we estimated the cost of a year of care as 52 weeks of tuition:

Cost of family child care for one child for two years = 52((weekly cost of family child care for a 4 year old) + (weekly cost of family child care for a 5 year old))*

Cost of family child care for one child for two years = 52(\$109.59 + \$106.12) = (\$5,698.68+\$5,518.27) = \$11,216.92*

Cost of center child care for one child for two years = 52((weekly cost of center child care for a 4 year old) + (weekly cost of center child care for a 5 year old))*

Cost of center child care for one child for two years = 52(\$144.23 + \$132.61) = (\$7,499.96 + \$6,895.72) = \$14,395.68*

3. Calculating the difference between the cost of TOP and the cost of early care

The TOP evaluation compares outcomes for TOP graduates to those of a demographically-matched control group at the cohort-level, rather than the individual-level. The present cost analysis focuses on differences in a relatively rare event: placement in special education. Differences in special education placement are most apparent when comparing the full sample of TOP graduates to the full control group.

Total TOP graduates in the 2013-2014 evaluation report = 749

Based on the calculation above, the estimated cost of educating all 749 TOP graduates was:

*Cost of educating TOP graduates in sample= number of children in sample*typical cost per TOP student*

Cost of educating TOP graduates in sample = 749\$14,664.76 = \$10,983,905.20*

As a comparison, we calculated what it would cost to provide typical child care for those 749 children. We had estimates for both home-based and center-based care. For the sake of simplicity, we assumed that roughly half of the children would have been in home-based care and half would have been in center-based.

*Cost of typical care for 749 children for 2 years = (375 children*cost of family child care for one child for two years) + (374 children*cost of center child care for one child for two years)*

Cost of typical care for 749 children for 2 years = (375\$11,216.92) + (374*\$14,395.68) = (\$4,206,345.00 + \$5,383,984.32) = \$9,590,329.32*

We calculated the difference between the cost of educating children at TOP and the cost of placing children in typical care to determine the premium for high quality early education.

Premium for high quality early education for 749 children=cost of educating TOP graduates-cost of typical care

Premium for high quality early education for 749 children for 2 years = \$10,983,905.20-\$9,590,329.32 = \$1,393,575.88

4. Estimating the effect of TOP on placement in special education

The TOP evaluation reports on rates of placement in special education among TOP graduates and the students in the control group. The table below lists total numbers of TOP students and students in the demographically-matched control group in the 2013-2014 report, by the two school districts (Wichita and Derby).

Total observations				
	Wichita TOP	Wichita control	Derby TOP	Derby control
Kindergarten	164	733	55	109
1 st grade	110	366	35	26
2 nd	91	384	24	16
3 rd	64	292	27	35
4 th	68	270	21	36
5 th	50	213	22	38
6 th	7	40	11	38

The table below reproduces the evaluation report's findings regarding special education placement for TOP graduates and the control group. Results are represented as percentages.

Special education placements (%)				
	Wichita TOP	Wichita control	Derby TOP	Derby control
Kindergarten	4	10	6	13
1st grade	8	14	12	28
2nd	10	9	16	27
3rd	8	14	18	11
4th	10	19	5	10
5th	13	18	21	27
6th	0	15	9	18

The table makes clear that, overall, a larger percentage of students in the control group were placed in special education than were TOP graduates.

The evaluation does not report raw numbers of children placed in special education, or rates of children placed in special education across both school districts. In order to calculate cost savings across both Wichita and Derby, we multiplied the reported rates of special education placement for each group by the total number of observations for that group:

*Total number of children placed in special education = percentage of children placed in special education * total number of observations*

We then added the total numbers of TOP graduates placed in special education in both districts, and added the total numbers of students in the control groups placed in special education in both districts.

Total number of TOP graduates placed in special education = number of Derby TOP graduates placed in special education + number of Wichita TOP graduates placed in special education

Total number of students in the control group placed in special education = number of Derby students in the control group placed in special education + number of Wichita students in the control group placed in special education

This produced the following estimates of numbers of children placed in special education:

	total TOP	total control
Kindergarten	10	87
1st grade	13	59
2nd	13	39
3rd	10	45
4th	8	55
5th	11	49
6th	18	60

We used the estimates above to calculate the percentage of TOP graduates and students in the control group that were placed in special education, and the difference between the two:

Special education placements (%)			
	total TOP	total control	difference
Kindergarten	5	10	5
1st grade	9	15	6
2nd	12	11	-1
3rd	11	13	2
4th	9	17	8
5th	16	20	4
6th	5	16	11

The above table demonstrates that children in the control group were placed in special education at higher rates than were TOP graduates in almost every grade. The one exception is the second graders, among whom 12% of TOP graduates were placed in special education and 11% of the control group were. Given the overall trend in the data, it is more reasonable to

assume that there was no difference between 2nd grade TOP graduates and the control group than that TOP had a negative effect on its students regarding this outcome. Therefore, in subsequent analyses we treated this difference as a 0 rather than a -1.

We multiplied the difference in the percentages by the total number of TOP graduates, resulting in the following estimates of the number of children who would have been placed in special education if they had not attended TOP:

Kindergarten	11
1st grade	9
2nd	0
3rd	2
4th	7
5th	3
6th	2
total	33

Estimating the number of students who avoided special education placement allowed us to calculate costs avoided by investing in high-quality early education.

5. Calculating the cost of special education placement

Kansas State Department of Education provided special education expenditures and number of students served by these services for both Wichita and Derby USDs. We used these figures to calculate average spending per student in special education across both districts:

District	FY14 Total Special Education Expenditures	FY14 December 1 Students with Disabilities Count	Average Per Pupil Expenditure
USD 259 Wichita	\$104,828,405	6854	\$15,294.49
USD 260 Derby	\$9,531,813	1032	\$9,236.25
total	\$114,360,218	7886	\$14,501.68

We then multiplied the estimated number of students who would have been placed in special education if they had not attended TOP by the average per pupil expenditure on special education:

*Annual gross cost savings on special education = estimated number of TOP graduates that would have otherwise been placed in special education * average per pupil expenditure on special education*

Annual gross cost savings on special education = 33\$14,501.68 = \$478,555.44*

Estimating the full cost savings associated with avoiding special education required making an assumption regarding the typical number of years a child would receive special education services. We could not find estimates for this figure for Kansas or nationally, so we used the rates of special education placement we calculated across the two school districts. In this data set, there is a bump in special education placements in 1st grade, and then again at 4th or 5th grade. Substantively it makes sense that those would be two turning points in a child's education in which it might become more obvious that some students need extra help. A 1st grader would get special education services for 12 years, and a 4th grader would get it for 9. I chose to assume that children would get an average of 11 years of special education services, because these data seem to suggest that many children were identified fairly early.

Gross cost savings on special education = cost of educating 33 children in special education for 11 years = 11\$478,555.44=\$5,264,110*

Although the cost of educating these 33 children at TOP is quite small compared to the cost savings of avoiding special education placement in the future, a more appropriate comparison is to the cost of educating all 749 TOP graduates in the study. There is no way of precisely targeting the children who may or may not end up in special education, depending on their early childhood experiences. Furthermore, the majority of children will not end up in special

education regardless of their early education experience, and some children will need special education services even after having attended a high quality preschool. Therefore, to estimate the cost avoidance associated with fewer special education placements, we compared the premium for high quality early education for 749 children with the cost savings on special education:

Net cost savings on special education=gross cost savings on special education-premium for high quality early education for 749 children

Net cost savings on special education=\$5,264,110-\$1,393,576=\$3,870,534

Return on investment (ROI) is calculated as follows:

ROI = (gain from investment-cost of investment)/cost of investment

The gain from investment here would be the gross cost savings of children not being placed in special education, and the cost of investment would be the premium for high quality early education:

TOP ROI (special education) = (gross cost savings on special education-premium for high quality early education)/premium for high quality early education

TOP ROI (special education) = (\$5,264,110 - \$1,393,576)/\$1,393,576 = 278%

According to these estimates, the return on investment in high quality early education is 278% by the time children graduate high school, based on special education avoidance alone. Other outcomes that this evaluation has not fully captured, such as improved reading and math ability and lower rates of disciplinary action, would likely increase this return.

6. Estimating short-term outcomes for students who were placed in special education

Source for estimates: Newman, L., Wagner, M., Knokey, A. M., Marder, C., Nagle, K., Shaver, D., & Wei, X. (2011). The Post-High School Outcomes of Young Adults with Disabilities up to 8 Years after High School: A Report from the National Longitudinal Transition Study-2 (NLTS2). NCSER 2011-3005. *National Center for Special Education Research*.

The longitudinal study above found that young adults with disabilities:

- were less likely than their peers in the general population to have attended a 4-year university (19% vs. 40%)
- were less likely than their general population peers to have completed their 4-year college programs (34% vs. 51%)
- earned an average of \$10.40 vs. \$11.40 per hour for young adults in the general population

Nationally, 80% of general education students graduated on time, while 61% of special education students did. This varied by state. In Kansas, the percentages were 85% vs. 77% for that time period.

We used these findings to estimate educational outcomes for the 33 children who would have been placed in special education if they had not attended TOP.

	Special education	General education	Difference
Graduate on time	$33 * 77\% = 25$	$33 * 85\% = 28$	3
Attend a 4-year university	$33 * 19\% = 6$	$33 * 40\% = 13$	7
Graduate a 4-year university	$6 * 34\% = 2$	$13 * 51\% = 7$	5

These estimates suggest that avoiding special education led to 3 more students graduating high school on time, 7 more students attending a 4-year university, and 5 more graduating a 4-year university. Again, these estimates are based on special education placement alone, and would likely be higher when taking other aspects of school performance account.

Because the study also reported average hourly wages for young adults in the first 8 years after graduating high school, we were able to estimate total difference in young adults' income:

	Average hourly wage (first 8 years after high school)	Estimated annual income	Estimated income over 8 years
Special education	\$10.40	$\$10.40 * 40 \text{ hours} * 50 \text{ weeks} = \$20,800$	$\$20,800 * 8 = \$166,400$
General education	\$11.40	$\$11.40 * 40 \text{ hours} * 50 \text{ weeks} = \$22,800$	$\$22,800 * 8 = \$182,400$
Difference	\$1.00	\$2,000	\$16,000

$\$16,000 * 33 \text{ young adults} = \$528,000$ in additional earnings in the first 8 years out of high school.

7. Estimating long-term outcomes for students who were placed in special education

Source for estimates: Julian, T., & Kominski, R. (2011). Education and Synthetic Work-Life Earnings Estimates. American Community Survey Reports. ACS-14. *US Census Bureau*.

The report above estimates lifetime earnings by educational achievement, partially reproduced below:

	9th-12th grade	High school graduate	Some college	Associate's degree	Bachelor's degree
Full time year round	\$1,132,564	\$1,376,132	\$1,639,209	\$1,794,747	\$2,370,231

We estimated above that 3 more students will graduate high school on time due to avoided special education placement. We used this figure as a proxy for high school graduation, because graduating on time is highly correlated with graduating at all.

$$3 \text{ students} * (\text{lifetime earnings of high school graduate} - \text{lifetime earnings } 9^{\text{th}}/12^{\text{th}} \text{ grade}) = \$730,704$$

7 more students will go on to attend a 4-year university:

$$7 \text{ students} * (\text{lifetime earnings of some college} - \text{lifetime earnings of high school graduate}) = \$1,841,539$$

5 more students will graduate a 4-year university:

$$5 \text{ students} * (\text{lifetime earnings of college graduate} - \text{lifetime earnings of some college}) = \$3,655,110$$

$$\text{Total increase in lifetime earnings} = \$730,704 + \$1,841,539 + \$3,655,110 = \$6,227,353$$

Sources

Bakken, L. (2014). Final Report TOP Early Learning Centers Longitudinal Research Project 2008-2014.

Julian, T., & Kominski, R. (2011). Education and Synthetic Work-Life Earnings Estimates. American Community Survey Reports. ACS-14. *US Census Bureau*.

Newman, L., Wagner, M., Knokey, A. M., Marder, C., Nagle, K., Shaver, D., & Wei, X. (2011). The Post-High School Outcomes of Young Adults with Disabilities up to 8 Years after High School: A Report from the National Longitudinal Transition Study-2 (NLTS2). NCSE 2011-3005. *National Center for Special Education Research*.

“TOP Early Learning Centers Expenditure by Year,” internal document provided by TOP for the purpose of this analysis.