



Redefining the Measurement of Early Childhood Program Quality and Child Outcomes

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Executive Summary

Research has shown that early childhood education is critically important to children's later success in school and in life. Neuroscience has categorically proven that the first five years of life are the most critical for optimal brain development. The question has become, what indicators of quality give us the best return on investment, and how do we measure and promote those quality indicators? The early childhood field acknowledges that structural quality and process quality elements work together to create the synergy resulting in high quality programs that lead to desired child outcomes. However, there continues to be debate about the concrete components of high quality and the precise combination of elements that result in consistent, significant, and lasting positive impacts for children.

Changing the approach

Research to this point has focused on measuring agreed-upon indicators of quality and then looking at their impacts on children's development and outcomes. Instead, this paper proposes that research needs to examine programs where desired child outcomes are consistently strong and examine those program practices to identify correlated indicators of quality. This reverse approach may assist the early childhood field to identify critical components of quality that have not yet been considered or have been only minimally studied. Then the field can focus on helping programs improve those components, rather than continuing to measure and rate elements of quality that have previously been identified but that don't strongly correlate with child outcomes. Developing a shared understanding of desired child outcomes that are associated with children's long-term academic, career, and life success—along with subsequent identification of a common set of indicators observed in high quality programs that correlate to these outcomes—would enable early childhood programs to become more consistent in accurately assessing meaningful elements of quality and to identify specific actions for continuous improvement.

Recommendations

- **Define a common set of desired child outcomes including both short-term success for school readiness with sustained academic and social gains; and long-term success in career and life.**
- **Invest in the creation and validation of developmentally appropriate, holistic measures of child outcomes, with a special emphasis on measures that address gaps in current research.**
- **Develop and fund well-designed experimental studies to identify the specific combination(s) of quality elements that provide positive impacts on child outcomes, resulting in a common set of quality indicators linked to outcomes.**
- **Review existing measures, as well as develop and validate additional measures of program quality to reflect the common set of indicators that result in child outcomes.**
- **Invest in rigorous longitudinal studies to document links between high quality programs and short- and long-term positive impacts on child outcomes.**

This approach, informed by policy and research, provides a strong return on investment: it develops a shared understanding of measurable indicators and outcomes to influence strategic funding of high quality programs that impact child outcomes. It also allows funders to make informed decisions. At the same time, it reduces confusion and conflicting requirements for early childhood programs that strive to implement high quality education.

Introduction

Since 1997, with the advent of the first Quality Rating and Improvement System (QRIS), researchers and educators have been formally measuring the quality of early childhood programs. Research has shown that early childhood education is critically important to children's later success in school and in life (Daelmans et al., 2017; Elango, Garcia, Heckman, & Hojman, 2015; Wechsler et al., 2018). Neuroscience has categorically proven that the first five years of life are the most critical for optimal brain development (Shore, 2003). As a result, increased funding has been allocated to early childhood programs, both in public and private settings through a variety of sources (Rolnick & Grunewald, 2003).

“
Quality Rating and Improvement Systems (QRIS) frequently take a compliance-oriented checklist approach to measuring quality, examining the presence or absence of individual quality elements without looking at the whole picture of a program's quality.”

—Tout et al., 2017

Increased funding has led to increased examination of programs to ensure that the money is spent well and is generating a return on investment (Institute of Medicine and National Research Council, 2012; Rolnick & Grunewald, 2003). The question has become, what indicators of quality give us the best return on investment, and how do we measure and promote those quality indicators? Research has generally agreed that elements of quality include instructional support

strategies, teacher education level and ongoing professional learning, engaging and developmentally appropriate curricula and classroom experiences, assessment to inform instruction and program planning, meaningful family engagement, and administrative practices (Burchinal, 2018; Doucet, Allen, & Kelly, 2015; Helburn, 1995; Meloy, Gardner, & Darling-Hammond, 2019; Wechsler et al., 2018).

Much of this research is based on seminal studies conducted in the latter quarter of the 20th century, such as the Perry Preschool Study (Schweinhart et al., 2005), the Abecedarian project (Campbell & Pungello, 2006), and the Cost, Quality and Outcomes study (Helburn, 1995). Additional longitudinal quality and outcomes studies have been conducted in the Chicago Parent Child Centers (Niles, Reynolds, & Roe-Sepowitz, 2008; Ou, Arteaga, & Reynolds, 2019) and New Jersey's Abbott Preschool Program (Barnett, Jung, Youn, & Frede, 2013). In addition, more recent research to develop and validate the CLASS (Hamre, Hatfield, Pianta, & Jamil, 2014; Hatfield, Burchinal, Pianta, & Sideris, 2016) and Environmental Rating Scales (Andersson, 1999; Early et al., 2007) has evolved our knowledge for early childhood education.

Burchinal (2018), Helburn (1995), and others have defined the specific elements of quality as fitting into two groups: structural quality and process quality. Structural quality elements—including characteristics of teachers and programs, such as education and training; adult-child ratios and group sizes; staff wages and benefits; leadership and administration; parent involvement; inclusion of children with special needs; and inclusion of home language and culture—have been found to be necessary, but not sufficient, to high quality programs (Barnett, 2011; Burchinal, 2018). These structural elements indirectly influence process quality in programs—the interactions between teachers and children, characterized by emotional support and intentional teaching (Burchinal, 2018; Hamre et al., 2014).

Based on the accumulated research knowledge to date, the early childhood field acknowledges that these structural quality and process quality elements work together to create high quality programs that lead to desired child outcomes.

However, debates continue about the concrete components of high quality and the precise combination of elements that result in consistent, significant, and lasting positive

impacts for children. In fact, research suggests that current definitions and measures of process quality are too narrowly defined (Burchinal, 2018).

The Challenge

There is little data available through studies on what constitutes high quality programs beyond QRIS validation research, and QRIS programs across different states often do not share multiple common measures of quality (Tout et al., 2017; Wechsler et al., 2018). In fact, early childhood programs are negatively affected by the multiple layers of attempts to define program quality (National Early Childhood Accountability Task Force, 2013; Wechsler et al., 2018). For example, state licensing requirements include high quality indicators in some states, and focus solely on basic health and safety in other states. Across states, licensing requirements may significantly differ from the quality indicators identified by QRIS programs, and accreditation standards from national accreditors sometimes further conflict with both licensing and QRIS. Early childhood programs are caught in the middle, trying to navigate the various requirements that are supposed to help them achieve and maintain high quality. States are challenged to balance access to early childhood education for all children while simultaneously ensuring quality across programs.

How do we define program quality?

The National Institute for Early Education Research (NIEER) has defined common quality measures for state requirements of publicly-funded early childhood programs through its quality standards benchmarks (Friedman-Krauss et al, 2019). These benchmarks include:

- Statewide early learning and development standards
- Strong curriculum with supports
- Teacher education and specialized training
- Ongoing professional development
- Maximum class sizes and ratios
- Child screening and referral
- A continuous improvement system

Similarly, Minervino's 15 essential elements framework (Weisenfeld, Frede, & Barnett, 2018) provides guidance to states on how to implement high quality preschool programs through an enabling environment of political will and support, rigorous and articulated early learning policies, and strong program practices. The early learning policies address the need for well-educated and compensated teachers; maximum class size and ratios; full school day implementation; early learning standards; effective and supported curriculum; and the inclusion of children with special needs and dual language learners. Strong program practices include:

- High quality teaching
- Ongoing professional development
- Child assessments
- Data-driven decision making
- Integrated systems of standards, curriculum, assessment, professional development and evaluation.

These two models for program quality elements align well with the body of commonly accepted research on high quality programs (Meloy et al., 2019; Wechsler et al, 2018). The challenge remains to identify measures that reliably and consistently identify high quality programs across the previously-discussed elements, as well as the components on which early childhood programs can focus improvement efforts to reach higher levels of quality (Leal, Gamelas, Barros, & Pessanha, 2018). Recent studies examining the impact of NIEER benchmarks or the 15 essential elements have found that progress across states has been uneven, and many states' publicly-funded programs are still not meeting these benchmarks of quality (Wechsler et al., 2018). Many studies have focused exclusively on publicly-funded programs, which leave out a significant population of children in early education settings (Phillips et al, 2017). This is due to challenges in accessing information from non-publicly funded programs, funding for validation studies and research, and

the fragmentation of the early childhood system (National Early Childhood Accountability Task Force, 2013).

In addition, studies that correlate quality measures with children's development and learning outcomes have demonstrated limited and mixed results (Barnett, 2011; Burchinal, 2017; Mashburn et al., 2008; Weisenfeld et al., 2018). Traditionally, program evaluation has focused on metrics of program quality, practices, and inputs rather than on child outcomes (National Early Childhood Accountability Task Force, 2013). The most common measures of child outcomes focus on foundational academic skills, executive function, and physical development at the current point in time (Elango, Garcia, Heckman, & Hojman, 2015). Only a few studies (Barnett et al., 2013; Campbell & Pungello, 2006; Ou et al., 2019; Schweinhart et al., 2005) have been able to capture longitudinal data on child outcomes and these rarely examine the correlation between participation in early childhood programs of varying quality or include control groups (Cannon et al., 2017). Longitudinal outcomes have often reviewed measures of readiness for Kindergarten (Camilli, Vargas, Ryan, & Barnett, 2010), retained academic advantage in 3rd grade (Burchinal, 2018; McCoy et al., 2017), and rates of high school completion (McCoy et al., 2017; Phillips et al., 2017; Schweinhart et al., 2005). These longitudinal outcomes studies documented impressive improvements in learning while children were attending early learning programs. They also showcase the long-term impacts on young adult outcomes such as increased graduation rate, lower grade retention, lower involvement with the justice system, decreased teen pregnancies. Adult outcomes are also reviewed, such as better health, higher earnings, stable housing and more (Elango et al., 2015; Phillips et al., 2017; Rolnick & Grunewald, 2003).

Recent research efforts have focused on defining quality and then trying to demonstrate a correlation with child outcomes (Burchinal, 2018; Cannon et al., 2017). Unfortunately, these associations have been inconsistent and modest when correlating current measures of quality with children's outcomes. None of NIEER's benchmarks have been found to significantly relate to child outcomes (Friedman-Krauss et al., 2019; Mashburn et al., 2008; Phillips et al., 2017). Multiple studies have found a lack of significant associations with child outcomes for generally accepted quality elements such as overall classroom quality as measured by environmental rating scales (Burchinal, 2018; Mashburn et al., 2008), teacher degree and specialized training in early childhood education (Burchinal, 2018; Mashburn et al., 2008), and ratios and group sizes (Burchinal, 2018). In

addition, there is a dearth of research on sustained positive academic effects, and the evidence of "fade out" of the academic gains children who experience early education have upon Kindergarten entry should be further explored (Barnett, 2013; Cannon et al., 2017; Elango et al., 2015; Phillips et al., 2017; Tout et al., 2017; Weisenfeld et al., 2018).

Most current publicly-funded programs are too new to measure long-term outcomes for children that have been documented by the early demonstration programs of the 1960s and 1970s. There is also the question of how much we can draw from an earlier generation of programs to guide today's programs (Phillips et al., 2017), as "we do not know what it was precisely about these programs that produced positive outcomes nearly 20 years later" (p. 19). Several researchers have discussed the problem of the "black box" of the early childhood classroom (Burchinal, 2018; Camilli et al., 2010; Cannon et al., 2017; Meloy et al., 2019; Phillips et al., 2017) and the resulting difficulty to isolate the contribution of a given element of quality to the overall effects of a program on child outcomes (Barnett, 2011; Camilli et al., 2010; Cannon et al., 2017).

Gathering meaningful data that can be analyzed for decision making presents multiple challenges that further cloud the process. Studies that examine quality often apply inconsistent documentation of program elements (Elango et al., 2015; Tout et al., 2017) which increases the difficulty of comparing results from one program to another. Funding and regulatory requirements may require different program measures than those commonly used to measure program quality, or they may require so much data collection that the process becomes burdensome to programs. Quality Rating and Improvement Systems (QRIS) frequently take a compliance-oriented checklist approach to measuring quality, examining the presence or absence of individual quality elements without looking at the whole picture of a program's quality (Tout et al., 2017). Some QRIS use a single measure of quality, such as the Classroom Assessment and Scoring System (CLASS), while others combine multiple measures including policy review, observations, program self-assessments and stakeholder feedback surveys (Tout et al., 2017). The most commonly used observational tools—CLASS and the Environmental Rating Scales (ERS)—have overall been found to lack significant associations with child outcomes (Mashburn et al., 2008). Programs frequently have limited capacity to collect and analyze data related to program performance, child outcomes, and ongoing continuous improvement (LiBetti & Mead, 2019; Tout et al., 2017). Even the federal Head Start program,

which spends a great deal of time and money collecting documentation of program effectiveness, has found that “much of the information collected is not used in ways that help individual grantees or the field as a whole to improve performance” (LiBetti & Mead, 2019, p. 32).

Where Quality Impacts Child Outcomes

Research has documented some key elements of program practice that do significantly correlate with child outcomes. Intentional teaching that focused on scaffolding higher order skills in individualized one-on-one interactions and small groups predicted later academic success more successfully than direct instruction focused on rote learning (Barnett, 2011; Barnett, 2013; Burchinal, 2018; Camilli et al., 2010). Evidence-based curricula, supported by aligned training and ongoing support for teachers, was found to have a small but significant effect on children’s literacy skills (Burchinal, 2018). Curricula that targets specific skills, rather than a more global curricula, has been found to more strongly impact children’s cognitive and social-emotional gains (Burchinal, 2018; Yoshikawa et al., 2013). However, the curricula must be used in a developmentally appropriate approach for these gains to persist over time (Yoshikawa et al., 2013).

Children’s experience of early childhood education through engaging activities and environments was also linked to short-term cognitive gains and long-term social gains (Barnett, 2011; Yoshikawa et al., 2013). Experiences benefit children the most when they are rich in content and stimulation while being emotionally supportive (Mashburn et al., 2008; Phillips et al., 2017). Higher quality teacher-child instructional interactions had the most

consistent and strongest associations with development of cognitive and language skills, while strong emotional support from teachers positively influenced children’s social competence and reduced challenging behaviors (Mashburn et al., 2008). Elango et al. (2015) found that short-term effects on noncognitive skills, such as social-emotional development and approaches to learning, are important determinants of desirable long-term outcomes such as self-regulation, perseverance, level of education attained, stable employment, better health outcomes, and reduced crime. Motivation, perseverance, and tenacity were found to be better predictors of children’s long-term success than standardized test scores (Meloy et al., 2019).

The challenge continues to be effectively measuring both child outcomes in the early years and characteristics related to process and interactions, which have historically been difficult to measure and regulate (Phillips et al., 2017). Our current measures of quality do not assess the content of what is taught or dimensions of quality such as the effectiveness of curricula and implementation, scaffolded learning, differentiated instruction or engagement of children and families (Burchinal, 2018). The relatively nascent work in measuring “soft skills” (Lefkowitz, 2018, p. 5), social-emotional learning, and children’s approaches to learning presents additional challenges as there are few valid and reliable measures for these outcomes (Meloy et al., 2019). “There are too few assessment tools that capture the full range of children’s abilities” (National Early Childhood Accountability Task Force, 2013, p. 26), and using a suite of assessments that do capture a holistic picture of a child tend to be costly and time-intensive in their implementation.



Ground quality improvement work in changes that have the potential to promote meaningful gains in children’s skills and competencies across developmental domains.”

—Tout, Soli, Epstein, & Lowe, 2015, p. 18

The Solution

Research to this point has focused on measuring agreed-upon indicators of quality and then looking at the impacts on children's development and outcomes. Instead, this paper proposes that research needs to examine programs where desired child outcomes are consistently strong and examine the practices in those programs to identify correlated indicators of quality. This reverse approach may assist the early childhood field to identify critical components of quality that have not yet been considered or have been only minimally studied. Then the field can focus on helping programs improve those components rather than continuing to measure and rate elements of quality that have previously been identified, but don't strongly correlate with child outcomes. Developing a shared understanding of desired child outcomes that are associated with children's long-term academic, career, and life success, along with subsequent identification of a common set of indicators observed in high quality programs that correlate to these outcomes, would enable early childhood programs to become more consistent to accurately assess meaningful elements of quality and to identify specific actions for continuous improvement.

Valid and reliable measurement tools aligned to these outcomes and indicators (LiBetti & Mead, 2019; Phillips et al., 2017) would support internal and external stakeholders to examine quality and assess outcomes. While existing policy papers (Friese, Lin, Forry, & Tout, 2017; National Early Childhood Accountability Task Force, 2013; Weisenfeld et al., 2018) have recommended a unified set of standards and assessments for early childhood program quality and child outcomes, a major barrier continues to be the vast differences in state definitions of quality as well as the layers of differences within state licensing, QRIS, and national accreditation requirements (Wechsler et al., 2018).

The changing context of our environment—from advances in technology to the evolving needs of a future workforce—exacerbate the need for different skills sets and differentiated means of learning in early childhood and throughout the education system. The current system is not yet responsive enough to these changing needs. Given that employers consistently state that “soft skills” such as collaboration, openness to feedback, critical thinking, and social IQ are as

important as academic excellence (Lefkowitz, 2018), are we measuring child outcomes, and the quality indicators leading to them, that reflect this emerging focus in the later years of schooling and workforce? Social-emotional foundations and 21st Century skills should be included along with academic performance to ensure that high quality early childhood programs are impacting children's long-term preparation for and success in school and life (Elango et al., 2015; Phillips et al., 2017; Tout et al., 2017). In fact, “many of the long-term outcomes that preschool programs hope to impact may actually be derived from social-emotional or behavioral skills, such as motivation, perseverance, and tenacity” (Meloy et al., 2019, p. 25). Evidence-based measurement tools are still in development in these newer fields of study, such as those from the assessment workgroup efforts of the Collaborative for Academic, Social and Emotional Learning (CASEL) and Oregon's development of a measure of children's engagement in the early learning setting (Tout et al., 2017).

In addition, investments should be made in further longitudinal studies to track child outcomes throughout their education career and into adulthood (Camilli et al., 2010; Cannon et al., 2017). Studies must focus on current quality indicators to examine whether they are in fact making a long-term positive impact on children. These studies need to expand beyond the “low hanging fruit” of publicly-funded programs that serve 3- and 4-year-olds to include private center-based and family child care programs that serve:

- Infants and toddlers
- Children with special needs
- Children who speak languages other than English (Tout et al., 2017).

Ideally, such studies would include control groups to overcome the limitations of quasi-experimental comparisons among programs that provide early childhood education (Burchinal, 2018; Camilli et al., 2010; Cannon et al., 2017).

Child outcomes should include measures of readiness for future academic success, coupled with social-emotional foundations and 21st Century skills. The outcomes should

look at children’s learning, growth, and development while participating in early childhood programs as well as longitudinal outcomes such as learner engagement, academic achievement, persistence, critical thinking, and education completion. Meloy et al. (2019) stated that researchers should design measures to “capture likely precursors of school progress and longer term success, which may include children’s self-competency, learning orientation, and scholastic motivation” (p. 25). This aligns with current trends in later school grades to shift toward competency-based learning and the development of critical “soft skills.” Establishing a common set of desired outcomes and the correlated indicators of quality should result from blending academic, theoretical research with practitioner expertise and engagement

Recommendations

Analysis of the current body of research leads to these specific recommendations for a research and policy approach.

Define a common set of desired child outcomes including both short-term success for school readiness with sustained academic and social gains; and long-term success in career and life.

Robust set of child outcomes should include, at a minimum, cognitive and academic skills; social-emotional skills such as self-awareness, self-management, social awareness, relational skills and decision-making; 21st Century “soft skills” such as critical thinking, creativity, collaboration, communication, flexibility, and information and technology literacy; and approaches to learning such as initiative, perseverance, attention, and problem-solving. Long-term outcomes should further include indicators of academic, health, and economic well-being, such as graduation rates, post-secondary education attainment, stable employment, wage earnings, stable housing, and reduced special education services, grade retention, teen pregnancy, and crime involvement.

Invest in the creation and validation of developmentally appropriate, holistic measures of child outcomes, with a special emphasis on measures that address gaps in current research. While some measures currently exist to address several categories of child outcomes listed in the previous recommendation, there continue to be large gaps in measurement tools that are valid, reliable, and

developmentally appropriate for young children. The development of additional measures should attempt to address issues of robustly measuring multiple skills in a single tool, while keeping the implementation manageable in terms of time, cost, training, and fidelity. New measures also need to be validated with large samples of children representing the full range of abilities, languages, cultures, and socio-economic status. Current measures should be examined in the context of holistic child outcomes, and complemented with additional measures to ensure the full range of outcomes is measured.

Develop and fund well-designed, experimental studies to identify the specific combination(s) of quality elements that provide positive impacts on child outcomes, resulting in a common set of quality indicators linked to outcomes.

To get inside the “black box” of the classroom, additional research studies are needed to examine programs that are contributing to positive outcomes along with programs that are not producing such results, in order to compare program practices and tease out the combination of quality elements that are linked to child outcomes. In addition, studies need to be inclusive of public, private, and home-based early childhood settings, as well as children who do not participate in a formal ECE program. Studies with promising results should be replicated across multiple program and child demographics in order to generalize findings to the early childhood field as a whole. Studies should include research on quality factors that currently demonstrate impact on child outcomes, such as instructional practices that individualize and scaffold learning; evidence-based and domain-specific, developmentally appropriate curricula supported for implementation fidelity; holistic child assessment that drives differentiated instruction and program/curriculum improvements; and content-rich, stimulating, and emotionally supportive environments and interactions.

Review existing and develop/validate additional measures of program quality to reflect the common set of indicators that result in child outcomes.

Existing measures, such as the Environmental Rating Scales, CLASS, and program administration assessments, should continue to be researched to determine how well they measure program impact on child outcomes, and the ability to meaningfully differentiate among levels of program quality. Existing tools were designed to provide individual classrooms with feedback on the learning environment, and were never intended to measure overall levels of quality

in programs or differentiate quality among programs. Furthermore, the existing tools are used inconsistently for quality measurement as each state QRIS determines arbitrary cut scores based on national averages rather than relationship to child outcomes. Additional measures may need to be developed in order to examine instructional practices that link to child outcomes such as content, level of instruction, teacher talk and scaffolding, any type of activity; organizational practices that contribute to effective teaching and learning; and other factors such as children's engagement in the early learning program, relationship quality between children and adults and among peers, family engagement, and children's continuity in high quality settings.

Invest in rigorous longitudinal studies to document links between high quality programs and short- and long-term positive impacts on child outcomes. Most recent studies have focused on children's academic, and less frequently social, outcomes through 3rd grade, as a result of attending preschool. As more funders invest in preschool opportunities for children, the program evaluation model needs to follow children beyond third grade to gain an understanding of the full complement of long-term program effects. Longitudinal studies will add to the body of work from the demonstration programs originally offered in the 1960s and 1970s, and contribute to the early childhood and economic fields' understanding of return on investment from high quality early learning experiences. Longitudinal studies should be designed to compare children from varying early childhood experiences whenever possible, so that findings can more rigorously be generalized.

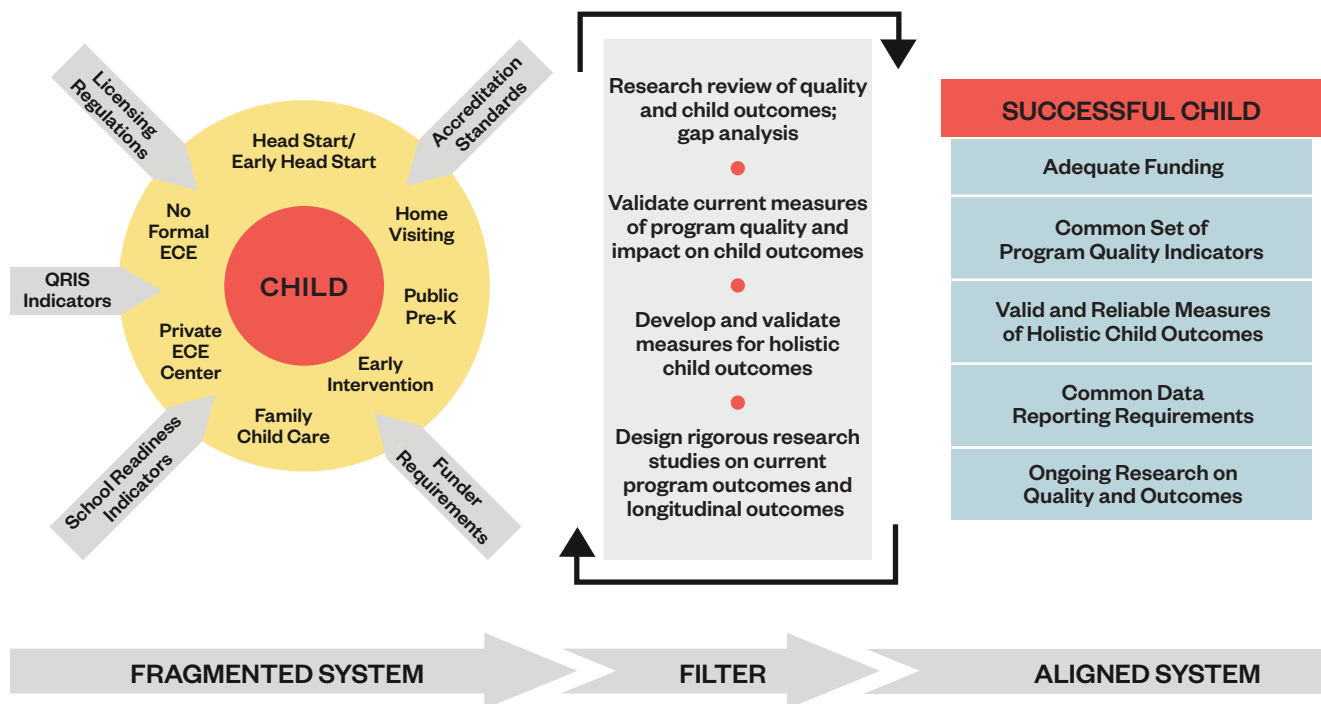
Anticipated Outcomes

Redefining the measurement of early childhood program quality from the lens of how quality impacts child outcomes has the potential to provide a shared definition of quality with measurable and consistent indicators of high quality programs that correlate with desired child outcomes. Such a set of consistent, reliable and valid measures can be used across contexts, funding sources, and states to impact early-childhood education in a systemic approach. Instead of the existing fragmented system with multiple influences of what programs should do for regulations, requirements, and quality improvement, the proposed approach that incorporates research and policy would contribute to an aligned system with common pillars of support to guide program quality that results in desired child outcomes. More work at state and federal policy and governance levels is needed to truly create the foundation of an aligned early learning system.

Wechsler et al. (2018) noted that strong local infrastructure through housing all children’s services under one umbrella, or creating a children’s cabinet that coordinates work among agencies, is essential to building an aligned system. Several states are implementing this approach, such as Washington’s gradual movement to house all children’s services within the Department of Children, Youth, and Families; and New Mexico’s recent legislation to combine services within the state’s department of education.

A shared understanding of measurable indicators and outcomes results in a strong return on investment: it combines the strategic funding of high quality programs with the ability to demonstrate quality implementation of indicators known to impact child outcomes (Rolnick & Grunewald, 2003; Elango et al., 2015). It also allows funders to make informed decisions to target funding to program

Theory of Change



improvements based on measures of high quality indicators aligned with child outcomes. In addition, it reduces confusion and conflicting requirements for early childhood programs that strive to implement high quality education. Such a shared understanding would allow programs, districts, and states to leverage investments in quality, such as accreditation, professional learning, and QRIS assessment, to minimize duplication of effort and leverage available funds for long-term results.

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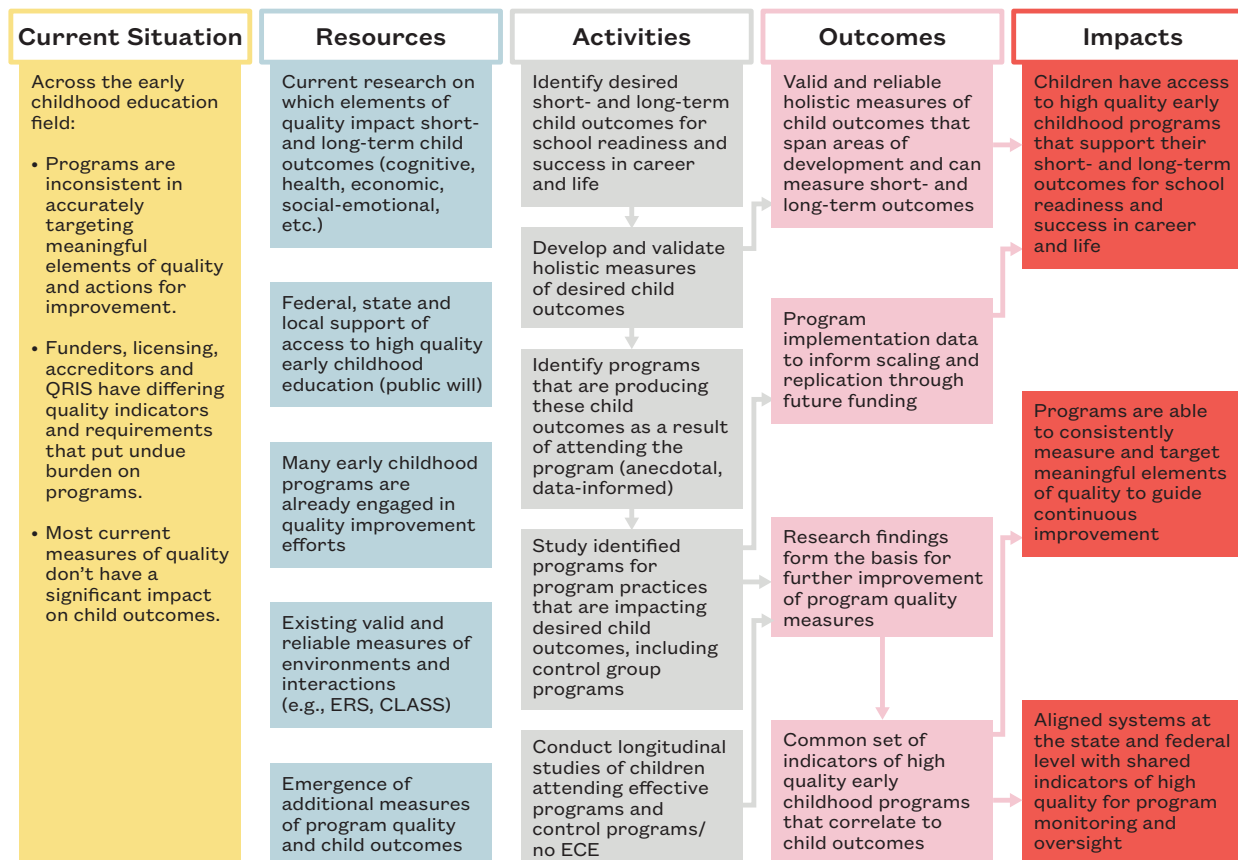
A shared understanding of measurable indicators and outcomes results in a strong return on investment: it combines the strategic funding of high quality programs with the ability to demonstrate quality implementation of indicators known to impact child outcomes.”

—Rolnick & Grunewald, 2003; Elango et al., 2015

An ongoing, longitudinal research agenda that follows children as they progress through their adolescence into adulthood provides validation or raises the need for additional study for both quality elements and measurement tools. A well-funded and well-researched field would be able to justify its claims for the importance of high quality early education and the return on investment in the early years. If quality indicators were tied to long-term outcomes such as post-secondary completion rates, improved health, mental well-being and increased earnings, families might be more selective in where they enroll their children based on expected outcomes. Ultimately, the entire system benefits from higher quality early childhood options available to all families and children, and children enter later school experiences positioned for academic, career, and life success.

Vision for Impact

Logic Model



In order to facilitate the full anticipated impact of this research and policy approach, a broader long-term strategy is needed. However, significant impact would be achieved in the next three to five years by following four approaches:

- Identifying of a comprehensive, but manageable, list of child outcomes that position children for school readiness and success in career and life
- Creating a suite of aligned and validated tools to measure the desired outcomes throughout the child's early childhood, elementary, and secondary school experiences at prescribed points
- Identifying programs that are already producing positive outcomes in the identified areas
- Impelementing well-designed, experimental studies, inclusive of these programs and control groups, to define the combination of quality indicators leading to outcomes

It is feasible for governmental agencies, funders, researchers, and programs to work together in order to accomplish these activities. Current Preschool Development Grant recipients are already gathering stakeholders from across the early learning field to conduct needs assessments. The Every Student Succeeds Act (ESSA) requires public school districts to reach out to the early learning community to establish relationships and work toward aligned practices to ensure children's school readiness. BUILD and other groups are working with several states in early childhood systems-

building efforts. Leveraging the existing relationships and workgroup goals, and expanding them to fill any gaps, can provide the early childhood field with the foundation for working toward systems alignment.

Ideal Conditions

The foundation of a strong local infrastructure that coordinates the approach to children's services at a state level cannot be overstated. If the early childhood field continues to work in the fragmented, multi-layered approach it currently uses, there is little likelihood of impact beyond the status quo. Stakeholders must be willing to set aside their political agendas and focus on creating a system that is best for children, now and for future generations. The system must also be inclusive of all the settings in which young children are being educated, and inclusive of all populations of children.

Increasing access to high quality programs and evaluating them against the impact on child outcomes must happen through adequate and sustainable funding. The tendency to try to get as much out of limited funding as possible has put a tremendous burden on programs to provide truly high quality early education without the necessary resources to be successful. Common estimates of return on investment are often based on program models that delivered a bigger dosage (length of day and instructional time) with additional wrap-around supports to children and families that what is currently funded in most Universal Pre-K programs or other publicly funded early education programs. Child care subsidy reimbursements continue to be woefully below the actual cost of quality care. Public and private funding levels need to be honestly evaluated and adjusted to match the actual cost of quality programs. If states are truly committed to the idea of high quality early childhood education accessible to all children, then significant funding increases are required. In addition, conducting rigorous, experimental research is expensive, as is the cost to validate measurement tools. Delivering on the proposed research agenda will require financial investment over both short-term studies as well as through the duration of longitudinal studies.

Strategic partnerships between state agencies, funders, researchers, and programs will support the implementation of the proposed research agenda. As system alignment becomes more prevalent and adequate funding is sustained, programs will be more likely to participate in data reporting and program evaluation beyond the mandates of funding requirements. State agencies and funders can ensure that program evaluation research is included, with requisite

financial and human resources, as part of the overall program approach. Research organizations can partner with programs to pursue funding, and be secured by funders to conduct program evaluation and outcomes studies. Many successful partnerships already exist within the field, and can be leveraged for knowledge of best practices and to expand opportunities.

Public will is a current asset in the early childhood landscape, as the general public has increased its awareness of early education importance over recent years. This public will has led to political candidates including early education in their campaign platforms, significant increases in federal spending on early childhood services, and expanded state and district commitments to providing preschool services to children. Continuing to generate public awareness of early childhood education, the return on investment, and the lifelong impacts is a key condition for success.

Barriers

There are recognized challenges within this policy and research approach. One challenge centers on the difficulty to isolate program variables from other contributing factors, such as environment, family engagement, and socio-economic status (Barnett, 2011; Camilli et al., 2010; Cannon et al., 2017). It is unlikely that quality elements will ever be identified that fully contribute to a child's outcome in any single area. However, well-designed research studies that control for external variables and include control groups for comparative purposes can mitigate this difficulty. Studies will also need to focus on sets of quality elements, as previous research has shown that few, if any, quality indicators impact outcomes in isolation. Implementation needs to avoid an oversimplified approach of relying on a single measure to validate quality or children's learning (Barnett, 2011; LiBetti & Mead, 2019). Instead, a suite of measurement tools would likely result from this approach to provide a robust and holistic picture of children's outcomes and program quality.

Another challenge is the relatively nascent work in measuring 21st Century "soft skills" and social-emotional learning (Meloy et al., 2019). Research on measurement tools would need to address the thinking about how to integrate and map these outcomes when there are not yet established best practices. Exploratory research as new measures are developed will help to establish these best practices, which in turn creates the ability to conduct validity and reliability research over time.

A continuing challenge is the difficulty to design measures of child outcomes that are developmentally appropriate and ensure objective results with fidelity of implementation. Young children often cannot take traditional paper and pencil surveys or assessments, so recommendations for best practice have been to use observational methods to assess children, or less preferred, to use verbal and pictorial prompts in one-on-one environments (Ackerman & Coley, 2012; Neisworth & Bagnato, 2004). These methods are time consuming and require technical skill and training to implement the assessment consistently and objectively. In addition, validation and reliability testing is quite costly due to the need for large data samples. It often takes several years, and many replications of a study, for a new instrument to have enough administrations to conduct psychometric evaluation (National Research Council, 2008).

Finally, the fragmented systems within the early childhood field present systemic challenges (National Research Council and Institute of Medicine, 2002; Shonkoff, 2010). As previously discussed, programs and research is currently underfunded, which impacts the ability to implement this policy and research approach in the current context. Education is historically grounded in local control (Jacob, 2017), so creating alignment and agreement on common indicators, outcomes, and measures may be difficult. However, there are examples of commonly-used measures and quality constructs that have been adopted across multiple states and program types (Tout et al., 2017). Learning from how these measures were adopted may help to address this issue. Another impact of local control is the difficulty of data sharing. Funders, quality oversight agencies, and other organizations all use different data systems and require different data points. Identifying ways to leverage data collection and monitoring in a more streamlined manner, while ensuring all early learning settings can provide information and track children's progress over time, would alleviate some of the current challenges with data sharing (LiBetti & Mead, 2019; National Early Childhood Accountability Task Force, 2013).

Evidence of Success

Upon full implementation of this policy and research approach, a common set of indicators of high quality early childhood programs will exist, correlated to child outcomes, with aligned measurement tools. Programs will be able to consistently measure and target meaningful elements of quality to guide continuous improvement. As a result, state and federal systems can begin to align with shared indicators of high quality for program monitoring and oversight. Valid and reliable holistic measures of child outcomes that span areas of development are developed to measure short- and long-term outcomes. This will ultimately result in children having access to high quality early childhood programs that support their short- and long-term outcomes for school readiness and success in career and life.

Conclusion

Many government agencies, funders, quality improvement initiatives, and advocates focus on the policies and practices needed to support high quality early childhood programs that contribute to positive outcomes for children. Current research demonstrates the difficulty in identifying program quality elements that directly impact children's short- and long-term outcomes. Redefining what child outcomes are critical to the academic, career, and life success of children and then identifying the quality elements that contribute to these outcomes, will enable early childhood programs to target those elements through continuous improvement.

This policy work is challenging, requiring broader thinking at a systemic level, and building strategic partnerships across state and federal agencies, funders, researchers, and early childhood programs with competing demands and priorities. The policy and research framework outlined in this paper calls upon the early childhood field to align in order to meet the needs of young children and provide access to high quality programs for all children. Streamlining funding, research, and data collection through the lens of a common set of quality indicators linked to children's outcomes, and supported by aligned measurement tools, will allow programs to more effectively implement high quality elements and ensure children's success.

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