Recommendations for Developing a Unified Early Childhood Data System

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Table of Contents

Grant Objective ................................................................................................................................. 1
Early Childhood Development and Key Policy Questions ................................................................. 2
What is a Unified Early Childhood Data System ............................................................................. 4
Recommendations for Developing a Unified Early Childhood Data System ..................................... 7
    Policy Recommendations ............................................................................................................. 7
        1. Establish or appoint an early childhood data governance body. ........................................ 7
        2. Create a unique, unduplicated state identifier (ID) for each child birth to kindergarten entrance age, parent or caregiver of young children, early childhood program and workforce. ......................... 8
        3. Require all publicly-funded early childhood care and education programs to participate in the unified early childhood data system by collecting data elements determined by the governance body; and encourage participation from privately-funded programs. ........................................... 9
Potential Barriers and Strategies for Addressing Barriers .............................................................. 10
Bibliography .................................................................................................................................. 12
Attachment A: Criteria for Assessing Quality of Early Childhood Programs .................................... 15
Grant Objective

*Develop recommendations for a unified early childhood data system that will inform the state regarding early childhood program effectiveness and children’s success in school and in life.*

The Nebraska State Advisory Council (SAC) grant is implemented on behalf of Nebraska’s Early Childhood Interagency Coordinating Council (ECICC)¹, the designated State Advisory Council meeting federal regulations (US DHHS, P.L. 110-134).

Two priorities were chosen by the Council: 1) school readiness; and 2) unified early childhood data system. Grant activities address: “the development of recommendations for a unified early childhood (birth to kindergarten entrance age) data system that can inform the state regarding early childhood program effectiveness and children’s success in school and in life.” These recommendations aim to inform continuous improvement efforts and ongoing policy development, as well as present practical steps to engage key decision makers in the creation of a unified data system.

A unified early childhood data system can help promote collaboration among state agencies and statewide organizations and thereby model and enhance collaboration among regional and local early childhood systems (i.e., programs, agencies, organizations, and services). Authentic collaboration often reduces duplication of services, maximizes resources, and creates broader understanding about what is needed for quality and continuous program improvement. Ultimately, a unified early childhood data system may help all stakeholders, including policy makers, program administrators, staff, schools, families and communities, to more effectively and efficiently define the scope and quality of early childhood care and education in Nebraska. Also, the potential for cost savings may be realized through streamlined collection, reporting, and evaluation efforts that help stakeholders understand what it takes to promote positive health and learning outcomes for all Nebraska’s young children and their families.

Numerous efforts at the federal and state level, and indeed locally, have supported aspects of early childhood data system development. At the national level, the Unified Data System requirement of the Race to the Top – Early Learning Challenge grant and the Federal Statewide Longitudinal Systems grant early childhood priority show federal prioritization of a statewide unified early childhood data system. In addition, twenty-five states have a statewide Quality Rating and Improvement System (QRIS)², a systematic approach to assess, improve, and

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¹ The ECICC is also an advisory body to agencies that carry out the provisions of state and federal statutes pertaining to early childhood initiatives under state supervision.

² Similar to ratings used for restaurants and other services, a QRIS designates a quality rating associated with an early childhood or school-age program, many of which receive public funding and are responsible for the care of hundreds of thousands of children each year. Typically, a QRIS has five components: a) quality standards, b) a process for monitoring standards, c) a process for supporting quality improvement,
communicate the level of quality in child care and early childhood education programs (National Center on Child Care Quality Improvement, 2012). In Nebraska, a bill has been passed to put in place a QRIS intended for increasing accountability for the public funds invested in child care and early childhood education (Legislative Bill 507, 2013). QRIS will provide new program and workforce data, but will not necessarily provide the linkages to child well-being data needed for a unified early childhood data system.

Successful state pilot efforts of cross-agencies early childhood data linkage include the Nebraska Maternal, Infant and Early Childhood Home Visiting (N-MIECHV) program (Nebraska Department of Health and Human Services, 2010) and the University of Nebraska early childhood longitudinal data linking pilot study (Raikes & Jackson, 2012). N-MIECHV program links various sources of data to assess maternal and child health, child welfare, school readiness, family self-sufficiency, and program quality processes and outcomes. The data will be utilized to demonstrate to what extent the programs are improving the quality of life for the families being served. Data will show areas where adjustments are needed to improve service delivery.

At the local level, United Way of the Midlands has invested in a data-sharing infrastructure and taken a leadership role in forming a data collaborative in the Omaha community to guide the design and development of the data system (Karbowski, 2012).

**Early Childhood Development and Key Policy Questions**

Research shows that early childhood may be the most important developmental phase throughout a person’s lifespan because it is the most intensive period of brain development (World Health Organization, 2009). Brain and biological development during birth to kindergarten are highly influenced by a young child’s environment. Adequate stimulation and nutrition are essential for physical, cognitive, social and emotional growth. Appropriate stimulation and nurturing care during the early years increases the likelihood of optimal development and learning. Conversely, when children spend their early years in less stimulating or less emotionally and physically supportive environments, brain development can be negatively affected and may lead to cognitive, social and behavioral delays. Later in life, this can mean these children may have difficulty dealing with complex situations and environments. High levels of adversity and stress during early childhood can also increase the risk of stress-related disease and learning problems well into the adult years.

Every year, Nebraska invests millions of dollars in early childhood care and education through the federal Childcare and Development Fund (CCDF), Head Start/Early Head Start, Early

d) provision of financial incentives, and e) dissemination of information to parents and the public about program quality. Quality standards provide the basis for program ratings. These standards vary across states but usually include measures of professional development or the qualifications of teachers and caregivers, the quality of the learning environment, and the involvement of parents and family members.
childhood care and Education Funding, Temporary Assistance for Needy Families (TANF), Title I (Education for the Disadvantaged) Preschool Programs, Special Education Preschool Grants, N-MIECHV, and Early Childhood Mental Health Funding. There has been increased accountability and reporting requirements to demonstrate that these public investments lead to desirable developmental outcomes in children.

Key policy questions related to results-based accountability include (but are not limited to):

- What percentage of young children (birth to kindergarten entrance age) experience high-quality environments (see Appendix A for a discussion of “quality”) that are stimulating and nurturing?
- How many young children are served by publicly-funded early childhood care and education programs (without duplicate counts of children who are served by multiple programs)?
- What percentage of young children and their families do not have the resources to meet their basic housing, nutrition and health care needs?
- What is the relationship between receiving early childhood education, prevention and intervention services and child development during school age and into adulthood?
- What is the quality of existing early childhood care and education programs?
- How many practices in existing programs and services have been shown to be effective by scientific research (i.e., evidence-based practices)?
- What percentage of existing programs are of sufficient quality to positively influence developmental outcomes (e.g. mental health, high school and post-secondary school graduation, employment, decreased welfare dependence, etc.)?
- How can the state improve the quality of the programs to produce desirable developmental outcomes?
- How skilled and stable is Nebraska’s early childhood workforce?
Recommendations for Developing a Unified Early Childhood Data System

What is a Unified Early Childhood Data System

To adequately answer the above key policy questions, it is crucial to develop a unified and comprehensive early childhood data system that embeds the following functionality:

- **Linking data about each child and family, program, and workforce:** Information about each child and his/her family that includes child and parent/caregiver demographics and economic data (where applicable), child health and development outcomes, as well as parent/caregiver indicators that directly impact child development; information about the early childhood care and education programs that each child receives, which includes program content, duration of service, the average staff to children ratio by program site,
staff turnover rate, and the evidence-based practices adopted by the program; information about the staff who provides the services includes compensation, level of education, number of years of experience, and continuous training and professional development.

- **Vertical (longitudinal) linkage**: Vertical linkages focus on children’s experiences as they grow in age. Example of vertical linkages include the transitions a young child makes from birth to the toddler years, the toddler year to pre-kindergarten, kindergarten to the early grades of school. Data about child participation and growth in the early years should be linked to data collected during school age (e.g. Nebraska Student and Staff Record System, NSSRS) through high school graduation and into college or career. Data could then be available to study the impact of early childhood education and prevention/intervention services on intermediate and long-term developmental outcomes.

- **Horizontal (cross-sectional) linkage**: Each young child should be easily linked to data other than the early childhood care and education field for a comprehensive evaluation of the child’s growth. This is often needed as many prevention/intervention strategies are interconnected. Horizontal linkages are those that exist concurrently, linking spheres of a child’s life among home, community, early childhood programs and school, and other services, such as health care, early intervention, parenting education and family support. The horizontal linkage is also referred to as a comprehensive or ecological approach in the early childhood world because it considers all aspects of the individual child (social and emotional development, communication, physical health, and cognitive) within the context of the child’s family and community.

- **User-friendly analysis**: This data system should embed report-generation capability that is low cost and easily accomplished. The reports should present data in such a way that any early childhood stakeholders can interpret the data accurately and make decisions accordingly.
The unified early childhood data system can be used for continuous improvement of early childhood care and education programs. Figure 2 provides a simple illustration of a continuous quality improvement (CQI) process possible with readily available data that are tracked on an ongoing basis.

Continuous Quality Improvement (CQI) is a process to ensure initiatives are systematically and intentionally improving services and increasing positive outcomes for children and families. CQI is a cyclical, data-driven process; it is proactive, not reactive. A CQI environment is one in which data is collected and used to make positive changes—even when things are going well—rather than waiting for something to go wrong and then fixing it. CQI is an ongoing process that involves the Plan, Do, Study, Act cycle.

![Continuous Quality Improvement (CQI) process](http://friendsrc.org/continuous-quality-improvement)

**Figure 2.** Continuous Quality Improvement process for early childhood care and education programs.

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3 EBP=Evidence-Based Practices, EIP=Evidence-Informed Practices. EBP are behavioral or mental interventions based on research studies that have been shown effective. EIP are also based on research evidence but lack multiple-site replications that show the practices are effective in different contexts.
Recommendations for Developing a Unified Early Childhood Data System

With the SAC grant funding, ECICC held Early Childhood Data Summits in June 2011 and again in January 2013, bringing together over two hundred key stakeholders from different state agencies as well as local communities who have expertise in data system and/or extensive experiences in early childhood care and education in Nebraska. These stakeholders include senators, state-agency administrators, early childhood care and education program administrators, expert researchers, and experienced data analysts. The following recommendations are based on their inputs in addition to a review of national best practices.

Policy Recommendations

It is recommended that a collaborative of state agencies and private entities involved in early childhood care and education adopt three new policies for developing the unified early childhood data system. If the collaborative does not have sufficient authority to authorize every aspect of the unified early childhood data system, the state may consider embedding these in existing policies, creating new policies, or formally creating the unified early childhood data system in statute:

1. Establish or appoint an early childhood data governance body.

The early childhood data governance body will be responsible for setting policies and protocols for the datasets necessary to answer the key policy questions in a way that ensure quality, privacy, security, integrity and transparency of the data. Data policies to be addressed include:

- what data to include in the system
- who will have access to what data
- who is responsible for hosting the data reporting system
- how the data should be analyzed and reported

Protocols are needed to cover data sharing agreements, common data standards, and data analysis, reporting and management.

Data sharing agreements. Develop clearly agreed upon terms for ongoing exchange of data from initial inclusion in the unified data system to longitudinal tracking. To address issues of privacy and security when sharing data, the governance body will look to the Department of Education and the Department of Health and Human Services for guidance. These agencies have strong internal controls that establish roles, permissions and guidelines in accessing various types and levels of their data systems that meet their federal (e.g., HIPAA – Health Insurance Portability and Accountability Act and FERPA – Family Educational Rights and Privacy Act requirements) and state regulations.
Common data standards. A data standard is a set of commonly agreed-upon names, definitions, option sets, and technical specifications for a given selection of data elements. For example, if the data field contains enrollment information, the definition may specify actual enrollment data at a point in time or cumulative enrollment. Before data fields can be linked across systems, the governance body is responsible to ensure that the fields refer to the same concepts, or else any information drawn from the data will not be valid or meaningful. Looking at the national best practices, the QRIS-Quality Initiatives Research and Evaluation Consortium (INQUIRE) Data Elements Workgroup\(^4\) partners with the Common Education Data Standards (CEDS)\(^5\) Early Learning Quality Group to develop and align common data standards for child, family, program and workforce data elements. This common set of data standards provides a structure that any state can voluntarily use to align data fields.

Data analysis, reporting and management. The governance body will ensure sufficient training is provided to the data users regarding the access, analysis and reporting of data derived from the unified early childhood data system, as well as promote and track the extent of data usage. For example, at the state level, the governance body can ensure the data are used to assess progress in achieving outcomes consistent with the state’s commitments to child wellbeing and make recommendations for any necessary adjustments.

Since early childhood data typically exist in multiple state agencies as well as non-state agencies and local program repositories, the data governance body needs to reflect the public/private interagency nature of the data system. It is critical to include several different types of individuals in this body, including decision makers with authority over budgets and agency policies, stakeholders who understand the meaning behind the data and how data would be used, and information technology or data managers who understand technology systems and privacy and security safeguards. The establishment of this governance body can be a new formation or appointment of an existing entity.

2. **Create a unique, unduplicated state identifier (ID) for each child birth to kindergarten entrance age, parent or caregiver of young children, early childhood program and workforce.**

Local early childhood care or education programs typically keep a roster of children enrolled in their program. If the program is administered by a public school, each child would have been assigned an ID upon being enrolled. However, since there are no systematic linkages among

\(^4\) INQUIRE was established with the purpose to support QRIS in producing high quality, policy relevant research and evaluation, and provide guidance to policymakers on evaluation strategies, new research, interpretation of research results, and implication of new research for practice. The Data Element Workgroup is responsible to develop a set of data elements that can guide data collection efforts.

\(^5\) CEDS is a national collaborative effort supported by the U.S. Department of Education and developed by a consortium of education stakeholders to develop voluntary, common data standards for a key set of education data elements for early learning through postsecondary and workforce.
programs, children served by multiple programs receive duplicate identifiers. This inhibits a reliable count of total eligible children and families receiving services from the publicly- or privately-funded programs. This problem can be solved by creating a unique child ID that links across data systems.

With a thorough consideration of confidentiality and privacy protection, the data governance body will determine when to create a unique ID for each child within the unified data system. A unique child ID may be created shortly after the child is born (based on birth records), upon enrollment into a program (based on enrollment records), or upon any other ways that will capture a new child into the data system for the first time. This ID is unique to individual child that can be used throughout all state agencies and public/private programs that participate in the unified early childhood data system. Currently, Nebraska has no requirement for early childhood care and education systems and programs to use the same unique ID to track individual child’s information across data systems. Datasets that do not contain a unique child ID will have to be linked by matching several identifiable data fields together such as first and last names, birth date, and parent/caregiver name. This is referred to as ‘probability matching’ in the data world. The records have to be matched on a case-by-case basis which will take an average of at least five folds the programmer’s time and other technology resources (Lin, 2012). A new data policy that requires all publicly-funded early childhood care and education programs to use the same, pre-assigned unique child ID to track children information in their data system will substantially reduce the costs of data linking.

Many services for young children are offered through their parents or caregivers. It is important to be able to identify if repeated services are given to the same parent or caregiver of multiple young children. The parent/caregiver ID may be created based on all useable identifiers observing the confidentiality and privacy protection regulations, and supplement with probability matching when needed.

Every early childhood care and education program should already have a unique identifier, which is usually the licensing number or tax ID. However, with programs operating in multiple sites/locations, there may be a need for adding an individual site ID to obtain more detailed information for quality improvement. Information about the early childhood care and education professionals will be nested within each program. Similar to parent/caregiver ID, a unique ID for each early childhood care and education professional may be created based on all useable identifiers and supplement with probability matching when needed.

3. **Require all publicly-funded early childhood care and education programs to participate in the unified early childhood data system by collecting data elements determined by the governance body; and encourage participation from privately-funded programs.**

Federal- and state-funded programs are usually required to submit program evaluation and outcomes reports to account for their early childhood care and education spending. However,
there is a lack of clearly defined standards for assessing quality, and no systematic requirements for reporting across programs. Consequently, the data are not useful for informing the quality of the programs and their impacts on child outcomes.

After the data governance body has identified the essential data elements, all publicly-funded programs should be required to identify a subset of data elements applicable to their programs, collect the data according to the common data standards, and submit the data to the unified early childhood data system.

The different programs are often interested in the same outcomes in the areas of the child’s physical and mental health and development, the environment where the child is living, parent/caregiver ability to provide quality care, etc. There are numerous redundancies in data collection in which the same data are collected and stored in multiple systems by multiple programs. Given formal data sharing agreements and a systematic data linking process in place, electronic data only need to be collected once and used widely across programs and state agencies. This can lead to streamlined efforts that translate to potential cost savings in the long term. Private programs should be encouraged to share data identified by the governance body and benefit from a state-wide data sharing process. This will also allow comparisons between children receiving publicly- or privately-funded services or both.

**Potential Barriers and Strategies for Addressing Barriers**

According to the Nebraska stakeholders as well as other states’ reports (Squires, Carolan, & Barnett, 2011; Nelson, 2013), the cultural and capacity challenges to data sharing are the major barriers to developing a unified early childhood data system. These barriers may arise when the proposed policies conflict with the existing operation. There may be resistance to significant operational changes for creating new pathways to collect and submit data when the management and staffs are comfortable with the old pathways. Potential operational changes include:

- Blending new policies with the existing policies and operations
- Collecting new data elements
- Changing data definitions to be consistent with the common data standards developed by the data governance body
- Changing data release timeline to be consistent across systems
- Using new technology platform to integrate the different data systems

These changes demand an increase in operational capacity. Some agencies or programs may need to build the capacity from the beginning which would be more challenging. For state agencies, establishing data sharing policies with outside entities, especially private agencies, could be uncomfortable.

With the Statewide Longitudinal Data System (SLDS) grant, Nebraska has already linked students in grade schools (K-12) by their unique IDs through the Nebraska Student and Staff
Recommendations for Developing a Unified Early Childhood Data System

Record System (NSSRS) data system (National Center for Education Statistics, 2013). The lessons learned will be valuable for developing a unified early childhood data system. Pilot efforts specific to early childhood data linkages accomplished by the N-MIECHV program (Severe-Oforah, 2012) and the University of Nebraska early childhood longitudinal data linking (Jackson, 2012) study will also inform the difficulties and practical solutions to data linking.

Other states also recommended the following (The Early Childhood Data Collaborative, 2012; Stedron, 2009):

- During the planning stage, the data governance body should solicit input from a wide variety of stakeholders including administrators of state agencies, early childhood care and education program administrators, parents, school superintendents, and data system consultants.
- Ensure the process is transparent, authentic and reciprocal to allay fears and concerns; listen to objections and quickly address them.
- Be mindful of the existing policies and operations of major agencies participating in the unified early childhood data system.
- Establish a framework for data sharing with outside entities to support research and evaluation consistent with privacy protection laws.
- Be intentional and consistent about the system’s purpose and use. A system explicitly designed for quality improvement is beneficial to everyone involved in early childhood education.
- Understand that a system’s utility will help ensure its sustainability. If policymakers, program administrators, child care professionals, teachers and others find the information useful, sustained support and investment can be expected.
- Develop web portals, data dashboards, scorecards and reports tailored to different users to make data more accessible and promote use of data.
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Attachment A: Criteria for Assessing Quality of Early Childhood Programs

Currently in Nebraska, the standards for quality in early childhood care and education are defined by funders and therefore vary by programs. At the Nebraska Department of Education (NDE), quality programs are those that meet NDE Rule 11: Regulations for Early Childhood Education Programs, nationally accredited by the National Association for the Education of Young Children (NAEYC), or fully meet Head Start Performance Standards. The U.S. Department of Education Elementary and Secondary Education Act (No Child Left Behind) also provides non-regulatory guidance that defines a quality Title I, Part A preschool as one that aligns with the federal Head Start Performance Standards (U.S. Department of Education, 2012).

NDE Rule 11 specifies standards for program planning, participation and inclusion of children and families, family development and support, meals/snacks, and program elements such as hours of care/education, child-to-staff ratio, qualification of teachers/program staff, professional development, etc. (NDE, 2007). NAEYC is a national agency that has developed clearly defined criteria for assessing the quality of a variety of early childhood care, health and education programs. The agency has identified ten primary aspects for assessing quality by stakeholders which include children, teachers, family and community partners, and program administration. For more detailed information see the NAEYC Accreditation Standards and Criteria (NAEYC, 2013). Head Start programs performance standards have many similar criteria as those of for assessing quality, but explicitly spells out standards for center-based, home-based, family child care, and combination program options. For more details refer to Head Start Program Performance Standards and Other Regulations – 45 CFR 1306 (Head Start, 2013).

Together for Kids and Families (TFKF), a Nebraska’s Early Childhood Comprehensive Systems project, defined quality child care as inclusive of all of the following elements:

- Have a state child care license
- Well-educated, well-trained, experienced attentive, responsive and engaged caregivers
  - Caregivers show affection, make eye contact, and speak directly to children with an encouraging tone
  - Children are soothed and supported when frustrated or challenged, helping them identify their feelings
  - Caregivers and families exchange information about the child’s development and learning progress
- A safe, healthy and child-friendly environment
  - Sufficient and age-appropriate materials and toys are accessible, organized, and inviting
  - Safe, outdoor play spaces invite exploration and nurture curiosity
  - TV and video are not used to occupy children
- Strict health and sanitation policies, including: an emergency plan, including staff trained in pediatric first aid and CPR; a handbook or written policies for parents, and healthy meals and snacks

- Stimulating Activities and Appropriately Structured Routines
  - Caregivers thoughtfully organize age-appropriate experiences throughout the day that incorporate language, math, science, art, music, movement, and dramatic play
  - Imagination and creativity are nurtured
  - Children learn to positively interact through positive guidance and discipline practices
  - Opportunities for children to interact in small groups and to play independently
  - A balance of active and quiet activities

- Low child-adult ratios and small group sizes:
  - Infants: no more than 8 with at least 2 teaching staff always present
  - Toddlers: no more than 12 with at least 2 teaching staff always present
  - Preschoolers: no more than 20 with at least 2 teaching staff always present

- Comprehensive supports for children and families such as health and nutrition, parent education and referral services

Sources include National Association for the Education of Young Children, First Five Nebraska, National Institute for Early Education Research, Nebraska Department of Education, and Nebraska Department of Health and Human Services (Together for Kids and Families Mental Health Work Group, 2012).
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