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Early Childhood Data Systems: Bridging the Gap from Discovery to Practice

Early childhood education has evolved as a field generating considerable information in the form of data. Individual, local, and organizational group data elements are being developed and stored across a number of settings. Data is being collected on a wide number of variables. The variability in the types of data being collected, how the data is stored and accessed and by whom, and the capacity of the system to effectively use the data that exists is often a major challenge.

There are several broad categories of system-level elements that warrant consideration when working with early childhood data systems. These include: (1) local, regional, and state systems that collect and analyze the data; (2) educational practitioners who generate the data and use it for instructional practice; (3) cross sector data collection and analysis requirements for this unique age-group population and service delivery system; and (4) the infrastructure that is needed to support the broader data system. This brief will explore each category, and will dig deeper into some of the critical elements that need review as systems examine, develop, and refine their early childhood data practices.

Local, Regional and State Systems

It is helpful to consider the many data system layers that must be considered when examining the broader framework of early childhood data. First, the layers range from the local classroom to the center or building level, and then larger organizational levels that reflect administrative structures such as community and for-profit programs and local education agencies. Stepping up to the next level would be regional, state, or federal level systems. Each system layer has inherent data requirements and expectations that make better (or worse) use of the information that is available.

Classrooms present unique challenges to the creation and analysis of data. A first task is to explore how classrooms collect data and if they use or have the technology to generate data. There may be individual classroom sites that provide services to young children with no computer or internet linkages, or they may be linked to a wider network. It is often common for child care centers to have only one computer with internet connection that is located in the director's office. Classrooms in local education agencies are often better resourced with computers in each room, typically linked to a building and sometimes district network. A second task is to explore what data is being generated. Data collection may involve basic collection of demographic information on the child and/or family. Depending upon the sophistication of the system, much more comprehensive data acquisitions may be happening. Information on children's developmental status, progress data, and familial information could be types of data stored on the classroom or program level. A third task is to examine where the data is being stored. The data may be maintained via a paper trail in a file cabinet or within the

individual hard drive of the classroom computer. It may be stored on a server somewhere in the building or linked with a larger organizational data warehouse structure.

Taking a broader perspective includes exploring how a larger organizational entity collects and uses data. In the current culture this examination often makes the assumption that the data is collected in a way that allows for both aggregate and locally generated data reports. Often this involves utilization of data stored in an electronic manner, such as computers, to enable effective analysis. That said, it is not uncommon to find person-generated paper reports based on manual data storage and manipulation. The administrative structure within the organization will need to have technological and analytic skills to support both ground-level and broader aggregate analysis. It will be critical to examine the capacity of the organization/system to determine the level of analytic support that will be needed.

Practitioners

Practitioners are the individuals that are the ground-level generators and users of data. They are pivotal to creating the data; play a key role toward assuring quality data; may be involved in data analysis; are sometimes the recipients of the analysis of data; and have responsibility to actively use the data in constructive and useful ways, i.e., instructional planning and implementation practices. Creating a data framework requires the careful analysis of the capacity and expertise of the practitioners to manage the data in a manner that positively impacts the instruction and learning for children for whom they are responsible. Important are the background capabilities individuals bring to the data process. Frequently, individuals who are the front-end creators of data do not have strong experience with data, data reporting, or how to ensure the data is used for instructional support. Access to adequate technological support may be problematic in some settings.

Practitioners come to early childhood educational settings with a wide variety of skill sets, but rarely is data management and analysis part of their training or background. These are not professional personnel preparation standards that are typically supported during pre-service training. Implementing a process to support practitioners' use of data will necessitate professional development to orient staff to data collection and analysis processes. As a follow-up, practitioners in early childhood settings will require ongoing, guided assistance to support them with data analysis and use.

Cross Sector

The highest level of data examination is at the broader administrative system level. A unique framework for early childhood systems is that data is often generated across different service sectors. Examples might be child care data that is generated by one state-level department, child development data generated and stored in another state-level department, and intervention data generated and housed in a completely different state entity. The ideal situation would have data systems that can regularly share across networks. That is often not the case; and establishing structures, policies, and data governance agreements to allow for the cross sharing of data will be important.

The National Center for Educational Statistics (NCES) has supported the Common Education Data Standards (CEDS) initiative and recently promoted data standards focused on early childhood. The common data standards allow for the accurate and consistent sharing of

information across entities. The standards support programs at various levels to identify key data elements and to use common definitions across sectors. Subsequently, when it becomes necessary to analyze data across sectors, it will be possible to do so with some assurance of data comparability and quality.

Infrastructure

There are structural elements that have to be established to support an effective educational data structure. These elements focus most often on administrative functions and practices that enable data practices to be effective and accurate. There tend to be two broad categories of elements - administrative and technological. The administrative elements focus on the agreements and collaborative practices undertaken by the respective administrations. The technological elements focus on hardware and software investments that have been made by the organization.

The administrative elements reflect the organization's commitment to the utilization of data as part of the effective implementation of educational practices. Some examples of these elements include supporting professional development of employees, committed allocation of financial resources to support data usage, agreements across program sectors to share data, and establishment of a committed data governance structure. The administrative infrastructure is the key background foundation for an effective data system.

The technological element of infrastructure rests with the organization's capacity to support a technologically-oriented data system. While it is possible for an organization to take advantage of a paper-oriented data system, the advantages of a technologically-based data system far outweigh other data management options. It is important to examine the organization's commitment to support the development and implementation of a data system that is directly linked to instructional practice support, and is child outcome oriented.

Use Case Scenario

Establishing a valid and reliable data link between the information on an individual student, i.e., a young child in the early-childhood program and his or her teacher, is a good example of the importance of having a well-managed system with high-quality data and strong practitioner abilities. Such a link, commonly known as the TSDL (Teacher-Student Data Link), enables a teacher to access the appropriate data on a particular child and track developmental progress for use in planning instruction, services, and support. Administrators can employ the TSDL with both individual and aggregated data to plan professional development, make staff assignments, allocate resources, prepare required reports, and so on. Putting in place the system requirements, policies, and professional development to support the TSDL and many other data uses is critical to effective early-childhood program management.

Summary

The expectation that systems are prepared to effectively use data to improve instructional practice in early childhood settings remains a considerable hurdle for many. Simply generating data does not result in a system that effectively uses that information in an instructionally supportive fashion. Practitioners need substantial support upfront to

understand what data is available, how to access the data, and then how to use the data in a way that supports effective instructional planning and implementation.

Supporting the capacity of organizations and the individuals in those programs will be critical. It is essential to assist these groups in understanding how to use the information through data-driven decision making processes. This strategy will be true for classroom teachers, administrators, and system stakeholders. It will be important to invest in the supports necessary to implement and sustain a data-driven framework. Such key investments will enable programs to establish and maintain a coordinated system for continuous improvement.

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