DATA QUALITY PROGRAM
HANDBOOK

Establishing a Culture of Data Quality – Pre-Work
An Extract from the Data Quality Program Handbook
2012
ACHIEVING A CULTURE OF DATA QUALITY PRE-READING QUESTIONS

Name: _______________________________________________________________________

Organization Name:  ____________________________________________________________

Answer each question below before completing your reading to help gauge your knowledge of data quality issues. You’ll have a chance to review these questions again to see how your understanding of the culture of data quality has expanded.

1. What is meant by a culture of data quality?

2. Why is collecting quality data important?

3. What are some examples of factors that can affect data quality?

4. Describe two to three roles and responsibilities of staff members involved in the culture of data quality.

5. Explain the importance of data ownership.
ACHIEVING A CULTURE OF DATA QUALITY

The NCES Forum Guide to Building a Culture of Quality Data\(^1\) notes that the components of a culture of data quality include the need for data to be **accurate, secure, useful, and timely** to serve a specific purpose.

- **Accuracy**: The information is correct and complete. Data entry procedures are reliable to ensure that a report will have the same information regardless of who inputs the data.
- **Security**: The confidentiality of child, student, and staff records must be ensured, and data must be safe.
- **Utility**: The data provide the right information to answer the question that is asked.
- **Timeliness**: Deadlines are discussed and data are entered in a timely manner.

The quality of the data becomes increasingly important as decision makers at all levels from the classroom to the state agency use data to inform decisions.

When an effective data entry and collection environment exists, staff will spend less time and money correcting errors and more time on other tasks, such as the instructional program. This can happen when all those involved in the collection and use of data are communicating, when all those involved respect the contributions of the staff who enter the data, and when all staff understand how the data are used. In fact, it depends upon building a culture of data quality.

The best place to start looking at the data collection process is the moment of data entry. Most of us understand that, in the education community, this moment usually takes place within multiple organizations, including schools, early childhood education centers, child care resource and referral (CCR&R) agencies, and family child care systems. We also know that data entry happens at many places within these organizations.

Data entered into a computer system might include an individual’s demographics, certifications, attendance, and grades—all entered in a busy environment such as an office, classroom, or conference room. Nurses enter health information; officials often enter budget, food services, or transportation data from various places around the campus or center; and teachers, providers, and other staff members enter enrollment information, attendance data, and assessments.

It is important for everyone to understand that, in all cases, data are entered into a computer so that information can be developed and used. One of the tasks of administrators is to work with staff so that they can see the relationship of the information to the data entered into a computer, and understand how that information supports instructional programs and business operations.

The goal is to establish conditions that will instill confidence among the users of the data. People who rely on reports must be able to trust that the information is accurate, that the confidentiality of an individual’s records is maintained, that the integrity of the data are secure, and that they’re getting the right information to answer their questions.

In this document, the environment that makes this happen is called a culture of data quality. It all starts with the data entry process. It exists where people believe that good information is important enough to warrant the resources needed to produce it. The components of a culture of data quality are in the Culture of Data Quality Framework figure, highlighting the
Establishing a Culture of Data Quality

Why is Data Quality Important?

Establishing a Culture of Data Quality

relationship between clear **procedures**, well trained **people**, and the technical and physical **infrastructure** necessary to produce data that are accurate, secure, useful, and timely.

In Massachusetts, school districts and state agencies play a key role in ensuring data quality. Districts and state agencies respond to the policies and regulations set by state and federal programs, as well as their own internal policies. District and state agency personnel are usually responsible for training data collectors and for ensuring that the data gathered are of high quality. Districts and state agencies may also dedicate resources to provide for the best data collection environments.
Procedures

Procedures are the rules and processes that govern what data are to be collected, stored, and reported.

Policies and Regulations

Schools are bound by district policies and early childhood education centers often provide state-supported services in conjunction with regional child care agencies that are bound by CCR&R policies. They are all bound by state and federal regulations that address what data must be reported and how these data must be reported. A common thread of these policies and regulations is a responsibility to the children being taught and cared for, and the resources they are given to do the job. Some of these policies and regulations exist to protect the expenditure of public funds.

Others are in place to ensure that children receive services, or to protect their rights as citizens. The multiple organizations serving our children are accountable for the financial support and services they receive as well as the children under their care. When we say that schools and early childhood education centers are the entities responsible for upholding these regulations, we are really talking about the demands made on school principals, charter school directors, and early childhood education directors. They are ultimately responsible for the information created from the data entered by their staff, and they have an ethical responsibility to report data as accurately as possible. To that end, principals and directors work with their staff to develop and distribute the onsite data quality policies needed to meet federal, state, district, and other data requirements.

In larger schools and early childhood education centers, the principal or director may be able to appoint a staff member to act as a data coordinator to manage the data and to work toward achieving a culture of data quality. In other situations, the principal or director might be the only administrator on site and may have to depend on an overworked staff to enter much of the required data. In any case, the principal or director is responsible for ensuring compliance with policies and regulations and for making sure the data allow achievement to be measured accurately.

If you have a culture of data quality, it is easier to meet the policy and regulatory demands of the various agencies that require information. When you have confidence in the data provided, you are more likely to survive an audit, for example, because you will have

- clear standards and guidelines for data quality;
- staff with the needed skills and information to enter data correctly;
- workable calendars and timelines to make sure the data are available when needed; and
- technology support in place to support these efforts.

Districts and state agencies usually have policies or regulations of their own that require validation of data. We recommend that any process involving the transfer of data be developed collaboratively. In the development of the data transfer process, you will want to include

- staff responsible for developing the reports or information;
- representatives from the technology group;
- representatives from the schools and early childhood education centers involved; and
- staff who are responsible for data entry.
By including everyone affected by data collection in the planning stage, the district or regional data coordinator can create a collaborative environment that fosters a culture of quality data. In this environment, the people responsible for all aspects of the reporting cycle will carry out their work with a full understanding of what is to be done and why it is important. Including staff in planning the process that will be used to meet the reporting requirements makes it much more likely that the data will be complete and accurate.

**Standards and Guidelines**

To build a culture of data quality in an organization, leaders will want to establish standards and guidelines that encourage respect for accurate data. Standards are the values or principles followed as an organization moves toward achieving a culture of data quality. Some of the issues the standards might address include what is considered an acceptable error rate, what turnaround time is acceptable for information requests, and what security measures must be in place.

Guidelines describe procedures for meeting the standards. For example, a standard might require that 100 percent of the items on an enrollment form be completed, while a guideline might describe the process followed when data are found to be missing. While policies and procedures usually originate outside the school or early childhood education center, school and early childhood education center personnel can also be involved in their development.

People who have done data entry work are able to give appropriate and important feedback about the work that they do. Data clerks are probably the best people to judge if a data entry screen is set up efficiently, to assist programming staff in determining the placement of an item on a screen, or to help the technical support personnel provide appropriate assistance.

Data entry personnel can also be involved in establishing the guidelines for addressing issues. For example, what happens if the ethnicity field is left blank on the enrollment form? Does the data entry clerk guess based on the student’s last name, or is the parent called? If the parent is called, who in the office makes that call? What happens if the parent objects? The fact that the ethnicity field might have to be completed may or may not be a policy issue. Guidelines will assist your staff in addressing the problem.

When we talk about building a culture of data quality, we believe that all staff need to know

- what data are entered;
- who enters the data; and
- the purpose for collecting the data.
It may seem that involving teachers and providers in developing standards and guidelines for data entry is not a good use of their time. However, during the past few years, data-based decision making has become a mantra for the education community, and teachers and providers make the instructional decisions. It is not enough to show teachers or providers reports with numbers representing achievements. They also need to know how the data get into the reports they review and, where possible, to ensure that the data are entered accurately.

Rarely is any database perfect, so how do you know that the data entered are correct? Even with adequate training, additional vigilance is necessary to monitor data entry. You might

- where possible, assign one person to act as your data coordinator;
- spot-check the data by hand, using the actual forms from which the data were entered;
- use returned mail to flag out-of-date addresses; and
- put your return address on all routine mailings so that, if an address is entered incorrectly, the envelope will be returned and the data corrected.

You will want to write the guidelines and standards your staff members have developed and post them where data entry takes place. Generally, guidelines will be followed much more reliably when the staff who are directly responsible for data entry are involved in creating the guidelines that apply to their work. Further, when educators and administrators understand the relationship between data entry and the reports they rely upon, a greater appreciation for the data entry staff will develop.

Standards and guidelines tell us how to implement policies and regulations. They can also point the way toward more effective data practices within the district and schools and the regions and early childhood education centers. Guidelines for reporting and data entry will be most effective when they are developed with the active participation of those responsible for quality data, including data entry staff.

Many of the items that are important in building a culture of data quality within a school or early childhood education center are also important in building a culture of data quality within other organizations, including districts, CCR&Rs, family child care systems, and state agencies. For example, to build a culture of data quality in these other organizations, administrators and coordinators will want to establish requirements for timely, accurate data; develop standards and guidelines that encourage quality; and use the resulting information to make data-based decisions.

Just as the existence of a data coordinator at a school or early childhood education center can bring a focus to data, the same is true at the district or regional office level. The data coordinator can create an environment in which staff can develop workable guidelines for meeting the data standards. The data coordinator’s role here is to encourage collaboration by involving representatives of data entry staff, technology staff, research staff, and data users. Among the support that such a group could provide are guidelines that

- describe the process to follow when an error is discovered in a report;
- state who will be responsible for notifying the school or early childhood education center if errors are discovered;
- determine who will follow up on the initial notice of a problem; and

Standards and guidelines tell us how to implement policies and regulations.
Establishing a Culture of Data Quality

Why is Data Quality Important?

- determine what reports or other assistance will be provided to schools or early childhood education centers as they try to correct errors.

The foundation for a culture of data quality rests on the ability of staff to collaborate. This is true within agencies and across agencies. When guidelines are developed collaboratively, districts, schools, regional agencies, and early childhood education centers can create real-world procedures that enhance the quality of information across Massachusetts, as well as within these organizations. As an added benefit, the state agency staff at the Departments of Early Education and Care (EEC) and Elementary and Secondary Education (ESE) will have a greater understanding of the needs of districts, schools, early childhood education centers, CCR&R, and family child care systems when additional data collections are proposed.

**Timelines and Calendars**

People who work at schools and early childhood education centers have to meet multiple deadlines during the year, and these deadlines often fall on the same date.

Therefore, it is important to control the workflow and to make sure that the entire staff knows what is expected during the year. You can work with staff to develop a specific data entry plan for those times of the year when an “enrollment crush” will take place or when grades or reassessments must be entered.

The principal, director, or an appointed data coordinator can develop a calendar of due dates and timelines that provide the necessary information. You can develop this calendar by using any number of simple software programs. You want to pick one that can:

- set up monthly templates;
- indicate due dates for reports;
- indicate due dates for data entry;
- designate holidays;
- designate days or weeks set aside for testing; and
- identify the staff person responsible for implementation.

The data entry and reporting calendar will be helpful to technology staff. The calendar will let staff know when to expect a greater use of the computer systems for data entry. This alerts them to schedule server maintenance before or after times of peak activity and to augment help desk personnel to meet increased needs.

Every school and early childhood education center has to contend with those times of the year when there is a spike in the data requirements. It is important for everyone who works with the data to participate in determining the calendar. This includes the technology department and the data clerks. Planning for the “crunch times” will make the entire data quality process go more smoothly.
Districts, CCR&Rs, and family child care systems, like schools and early childhood education centers, are often at the mercy of deadlines that others have set. These organizations have their own data needs and schedules. Therefore, it is critical to develop a district or regional agency data calendar that will help track the times when reports are due and when schools and early childhood education centers must provide data to meet these deadlines. You will want to use the calendar to identify what data are required from schools and early childhood education centers, and when the district, state, or federal programs need the information.

The data coordinator can be responsible for maintaining this calendar. Involve the program offices, including the information technology staff, in planning the data calendar. Through this collaboration, you can avoid overlapping dates. Moreover, these meetings can evolve into discussions about reducing redundant data requests. And, of course, it is very important to distribute the data calendar, with timelines and deadlines, to all staff. This will enable the school or early childhood education center data coordinator to work with his or her staff to develop a calendar that will ensure data are entered in a timely manner.

When asking for information from schools or early childhood education centers, explain the purpose of the information requested and link the request, wherever possible, to the instructional program. If the data request does not directly relate to the instructional program but is needed to qualify for financial or other resources, or to satisfy a federal regulation, it is more important for personnel to understand the reason for the collection. When staff members are informed, their understanding of the process will enable them to perform at a higher level of competency.

In a smaller school or early childhood education center, it might not be possible for the principal or director to appoint a data coordinator. In this case, it is necessary for the principal, director, or someone else in the school or early childhood education center to be responsible for tracking the due dates of various reports and working with staff to ensure that data are entered in time to meet deadlines.
People

For data collection to result in quality data, there must be well-trained staff on hand to do the work.

Traininng and Professional Development

Both training in specific skills and broader professional development are important in ensuring accurate, responsible data entry.

In most cases, the district or region provides professional development programs. However, some training and professional development within a school or early childhood education center will go a long way toward creating a culture of data quality. It helps when administrators

- encourage staff to attend professional development or training sessions;
- allow attendees to discuss findings and new directions at staff meetings or in written communications;
- hold discussions that include all staff members so that everyone understands the importance of quality data; and
- involve those responsible for data entry and security in discussions about what changes in procedures may be needed.

Professional development programs need to be more than a demonstration of new software to clerks and other staff responsible for entering data. A culture of data quality is inclusive. Data clerks, teachers, providers, and administrators need to know the impact of the data, that is, how the data will be used.

An effective professional development program can link the entry of data to reports and instructional programs. For example, educators, administrators, and other staff need to know the relationship of

- enrollment data to appropriate placement in classes and programs;
- timely reporting of attendance to the ability to notify parents of absentees;
- accurate and timely entry of grades and progress reports to the ability to generate reports to parents; and
- free and reduced-price lunch data to schools’ eligibility or funding for student nutrition programs, child care subsidies, Title I services, and the E-Rate telecommunications program.

Training and professional development provide an important opportunity for a district or agency to have an effect on data quality. A consistent, comprehensive professional development program, stressing the importance of the process to all staff, will go a long way toward developing a culture of data quality. If professional development for staff responsible for data entry is to be effective, the training will consist of more than a recitation of the keystrokes needed to complete a rote task. Staff responsible for data entry, from the office clerk to the nurse to the educator, will value the process leading to quality data when their role in the process is valued.
The superintendent, state agency representative, commissioner, and board of education can send a strong message about the importance of data quality and those who are responsible for it. You will want to instill a belief system that enables those entering data to understand the importance of this seemingly rote task. Consider the impact of a training program that includes

- respect for the intelligence of the people responsible for data in the school or early childhood education center;
- hands-on training to get staff accustomed to using the data entry screens;
- handbooks or guidebooks that are inclusive, with copies of data entry screens, systematic instructions, and the rationale for entering the data;
- procedures for obtaining assistance (e.g., help desk phone number, website, online and/or e-mail query process);
- copies of the reports created from the data in the training handbook so that the people entering data will have a sense of how their work affects the operation of the school or early childhood education center; and
- an opportunity to provide structured feedback about the training program and general data entry issues.

While providing training directly to personnel responsible for entering data is most effective, sometimes it is not possible. In larger districts or regions it may be necessary to train administrators or a data coordinator who will, in turn, be responsible for the hands-on training of their staff members. Under these circumstances, you may want to offer a presentation program on a website.

Reliable training materials will help to make sure that a consistent message is delivered. In addition, the tools can serve as a reference for the data entry staff. The presentation program has to be well designed in order to

- convey the value top leadership places on the skills/practices being taught;
- provide the opportunity for practice; and
- advise people how to get additional help.

Sharing copies of reports with the personnel responsible for data entry allows them to see the results of their work. You may want to schedule follow-up discussions after the completion of new or major data efforts to see what worked and what needs to be improved. If individuals are aware of the importance of the collection of quality data, it is more likely that they will put out the effort to ensure the data collected are of the highest possible quality. When it is necessary to hire part-time staff, pay particular attention to the appropriate training necessary to achieve quality data. Investing resources in formal training pays benefits that justify the expense. It shows that the work is important and establishes consistency.

The training doesn’t have to be elaborate; in addition to a demonstration of the keystrokes necessary to enter the data, include an explanation of the importance of the work and a sample of the information that will result from the data entry.
Infrastructure

Infrastructure that supports quality data includes both the work environment in which data are collected and entered, as well as the technology that supports the work.

Data Entry Environment

A perfect data entry environment would consist of enough space to work comfortably, that is, enough space to enter data into a computer and display the documents that contain the information to be entered. The area would be quiet, so that the data entry clerk can concentrate. Data entry can also be made more efficient and accurate if the administrator sets aside a regular time of day for data entry work and locates the data entry area away from traffic patterns.

However, we know that schools and early childhood education centers are very unlikely to have an ideal space for data entry. There is always something happening to distract attention from any one task. When is an office, workroom, or classroom free from interruption? The best that we can hope for is that staff will try to limit interruptions and that the school or early childhood education center will provide an appropriate space for the person who is entering the data.

When we talk about creating an appropriate environment for data entry, we mean much more than the physical conditions for data entry. By examining the process of data entry in a school or early childhood education center and looking at the roles of all the staff that are part of this process, a school or early childhood education center can create an environment that supports data entry and leads to quality data. When such a climate exists, and data entry staff are given the support they need, data will be more accurate.

Every district and agency has programs that compete for a limited amount of money. Program funding is tied to accountability measures that, in turn, are based on data collected by schools and districts, and early childhood education centers, CCR&Rs, and family child care systems. It is in the best interest of other agencies to provide the resources needed to produce quality, timely data.

In some cases, overtime pay for office staff responsible for data entry may be an effective way to meet data entry deadlines. In other situations, you will want to measure the productivity of overworked staff against the difficulties of hiring more people to do the work.

You may want to examine hiring part-time staff at those times when a great deal of data entry is expected—for example, at enrollment time.

When enough staff members have time to dedicate to data entry, in a place where interruptions are minimal, the quality of data will increase. Organizations may not have the funds to provide the number of personnel or the physical conditions needed for optimal data entry. Nevertheless, recognizing the importance of data entry and working toward these goals, even if they cannot be met in full, will help to bring about a culture of data quality.
**Technology (Hardware + Software + Network)**

Schools and early childhood education centers don’t usually manage the hardware or software that supports data entry. However, as users of the technology, their personnel have a role to play. Data quality depends on how user-friendly the systems are. When the data entry screens are confusing, there is greater possibility of data entry errors.

When you think about data entry systems, realize that they do not need to be static. There is always room for improvement. When the people entering the data have recommendations for change, support those requests. It is often up to the administrator or the data coordinator to help the technology department understand the changes recommended by data entry staff. Data entry staff are able to give good advice, for example, when it comes to data entry screen design or software augmentation.

A computer infrastructure exists to serve the needs of the people in the organization. This is true even though it may seem at times that the needs of the machines take priority over getting the work done. This situation can be avoided if you involve the information technology staff in the decision-making process about data collection and reporting.

The participation of the information technology staff in the development of a data entry or data reporting calendar allows them to adjust schedules to meet the needs of the greater school community. Working with the data coordinator and other members of the staff, the information technology coordinator or director can schedule extra support personnel, as needed, and can arrange for maintenance to be carried out at times of low system use.

An important role district, CCR&R, and family child care system personnel play is to ensure the accuracy of data received from schools and early childhood education centers. Technology can help here through the automation of quality control. Mistakes can be avoided when the computer system prevents entry of obviously incorrect data. This also frees teachers, early childhood educators, nurses, food service personnel, and other individuals engaged in data entry from a lot of number checking.

Data entry staff, administrators, and technology personnel can work together to produce and implement the specific edit-checks that serve the needs of your district. For instance, if 1=male and 2=female for a particular field, allow only a “1” or a “2” to be entered in that field. Similarly, if a telephone number field requires an area code, do not allow a phone number with fewer than ten numbers to be entered. Edit-checks can correct errors before they occur.

It is a standard business practice to use passwords to secure the privacy and confidentiality of personally identifiable information. You will want to write password security procedures and distribute them to all staff. Ensure that passwords are of a sufficient length (e.g., a minimum of eight alphabetic and numeric characters) and procedures require passwords to be changed frequently (e.g., every 30 to 60 days).
When implementing security procedures, staff should be instructed to memorize their passwords—don’t write down; don’t tape to a monitor or keyboard, don’t hide under a desk. It is best to include a help desk or another process for staff to use if they forget their password. Password restoration procedures should include a method to verify the identity of the person calling the help desk. This might include asking for the staff member’s social security number, mother’s maiden name, or some other item.

Summary

Effective policies, guidelines, professional development, and efficient environments are all earmarks of an organization that values data quality. It is understandable that these conditions will not develop overnight. Like the creation of any other successful program, the creation of a quality data system takes time and requires the development of a systematic process.

Throughout this document, the emphasis has been on the contributions of those school and early childhood education center, CCR&R and family child care system staff members who enter data. Some members of the staff enter data as a primary responsibility. Others enter data only when there is an urgent need for the data. Still other members of the staff such as teachers, providers, administrators, or nurses, are required to enter data for part of a day or for a few days during the year. All of these staff members, and the data entry process, need to be treated with respect and understanding since they represent the foundation of quality data.

As you think about the quality of your data, ask yourself these questions. Then consider asking these questions of others in your organization.

- Are data entry and collection valued tasks?
- Do staff understand why data are being collected?
- Do staff see the reports that are created from the entered data?
- Do data entry staff understand how teachers and providers use data to enhance instructional programs for individual children?
- Do staff know how much money is brought into individual entities because of the data that are entered?