Education Management Information System and Data Management

To carry out its duties in overseeing Ohio's public education system, ODE needs complete and accurate data from all local education agencies (LEAs) on their students, staff, operations, and finances. This data is vital to the State of Ohio and the general public as is dictates how funding is allocated and provides transparency into the operations of Ohio's educational institutions. A single, standardized data collection system is crucial for ensuring that data can be used both to evaluate individual LEAs and to manage the overall statewide education system.

Background

In 1989, ORC §3301.0714 required the State Board of Education to implement the statewide Education Management Information System (EMIS). This system collects data reported directly by LEAs and allows ODE to manage and report on that data. ODE is responsible for maintaining the system and developing reporting standards and procedures. LEAs are legislatively required to report all data specified in ORC §3301.0714. ODE categorizes data collected into the following major types:

- **Student Data**, including demographics, attributes, attendance, courses, programs, and testing;
- **Staff Data**, including demographics, attendance, and course information;
- **General School District and Building Data**, including building lists and student transportation; and
- **Financial Data**, including five-year forecasts, revenues, and expenditures.

The data collected in EMIS is used to support internal ODE operations as well as provide transparency to the General Assembly and public. Student data collected in EMIS is a critical component in the State foundation funding formula, which determines how state funding is distributed to LEAs (see **Section 4: State Foundation Payment Process**). Data collected in EMIS is used in generating statewide and district reports, including academic assessment results; Ohio School Report Cards; district data profiles; and other requested reports from varying stakeholders, such as the legislature, educators, and the general public. EMIS data is also used to meet federal reporting requirements, such as those required by Title I, Title II, and the Individuals with Disabilities Education Act (IDEA) Part B.

Each LEA has a designated EMIS coordinator who is responsible for submitting and verifying all data required for EMIS. While not required, many EMIS coordinators belong to the Ohio Association of EMIS Professionals (OEAP), which provides training and professional certification for its members, and also provides valuable stakeholder feedback to ODE.

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Information Technology Centers (ITCs) also play an important role as an intermediary between LEAs and ODE. The ITCs compile and format most LEAs' EMIS data prior to submission. They also provide training and guidance to EMIS coordinators.

ODE created and maintains an EMIS Manual, which includes standards and procedures designed to ensure uniform data collection across all LEAs in Ohio. The manual includes data definitions, requirements, and reporting procedures to assist LEAs with submitting, reviewing, validating, and correcting their data. It is the primary tool used by EMIS coordinators and staff at ITCs to ensure that federal and state reporting requirements are met. The current version is accessible on ODE's website, and is divided into seven sections:

- Section 1: General Information;
- Section 2: Student Records;
- Section 3: Staff Records;
- Section 4: Course Records;
- Section 5: District/Building Records;
- Section 6: Financial Records; and
- Section 7: Five-Year Forecast Records.

EMIS Advisory Council (EAC)

To support ODE's management of EMIS, the General Assembly enacted legislation in 2018 that created an EMIS Advisory Council (EAC or the Council).[1] The Council is made up of ODE employees and external stakeholders, and its purpose is to analyze all aspects of EMIS and make recommendations to ODE to help improve the system, as well as the EMIS Manual.

The EAC currently has 25 members, including a chair and vice chair from ODE and four additional ODE staff members.[2] The remaining council members are selected from superintendents, treasurers, EMIS coordinators, ITC staff, and State Board of Education members.

The goal of the Council is to carefully analyze all aspects of EMIS and gather both short-term and long-term recommendations. The council has created two recommendation reports: the original report completed in June 2019 and a follow-up report completed in June 2020.

Why We Looked At This

EMIS is used by over 1,000 entities including traditional student districts, community schools, joint vocational schools, educational service centers (ESCs), and ITCs. Each of these entities has staff dedicated to collecting and reporting EMIS data. The data outputs from EMIS are used by many departments and program offices within ODE. A review of processes related to EMIS is crucial to ensure appropriate oversight over Ohio's public education system.

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[1] ORC §3301.0713
[2] EAC bylaws allow up to 30 members.

What We Looked At

Feedback was obtained from EMIS users to identify opportunities for improvements. We also interviewed ODE program offices that use data outputs from EMIS to determine if their operational needs for EMIS are being met, or if there are aspects of EMIS that are inefficient or ineffective for their needs. Further, we conducted a statewide survey of LEA officials to gain insight into how LEAs are using EMIS, the sufficiency of guidance provided by ODE, and if there are opportunities to improve the user experience with EMIS. The survey was sent to a total of 2,151 EMIS coordinators, superintendents, and treasurers. The survey was completed by 44.7 percent of those who received it.

Recommendation reports from the EAC were reviewed and compared with feedback we obtained from ODE program offices and our survey of LEA officials. Last, we assessed if there were opportunities for improvement not already being addressed by the EAC, and if there were common themes that should be the focus of ODE's improvement efforts.

What We Found

EMIS was reviewed in prior performance audits in 2002 and 2013. In those audits, we found significant issues with the EMIS system, system guidance and utilization. Since that time, it appears ODE and the General Assembly have worked diligently to improve the shortcomings of the system.

In this audit, we found that ODE has processes in place to regularly update the EMIS Manual, communicate information to stakeholders, receive and implement stakeholder feedback, and provide EMIS training. Although ODE has made improvements in these areas over time, our analysis identified areas for further improvement that will allow ODE to better meet the needs of EMIS users.

EMIS Manual updates are performed as necessary, and occur as often as two times per week. These updates are communicated to LEAs by ODE through their website and emails directly sent to all users. ODE also publishes an annual EMIS update report showing all changes made to the manual. However, our survey of LEAs found that a significant number of EMIS coordinators do not feel the EMIS Manual always offers sufficient instructions and that they are not always well informed of updates and changes to the manual. ODE program office employees noted that the EMIS Manual is sometimes difficult to understand and should be updated more frequently. These results suggest that there are areas of improvement for ODE.

ODE, along with ITCs and the OAEP, provides several trainings throughout the year for EMIS coordinators. Training is offered through in-person instruction, live video conference calls, and recorded training videos. However, our survey of EMIS coordinators found that more than 20 percent do not think ongoing training is adequate, and more than 45 percent did not think that the introductory training they received was adequate.

Based on our analysis, we identified one recommendation that would assist the Department in improving operational efficiency and effectiveness in relation to EMIS:

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- **Recommendation 3.1**: ODE should continue working to revise and update EMIS, the EMIS Manual, and EMIS trainings to better serve its stakeholders.

Recommendation 3.1: EMIS

ODE should make strategic improvements to its internal processes involving EMIS to enhance user experience and ensure user needs are met. This would ensure that LEAs receive maximum value from the system and are better able to use the management information generated through EMIS reports to tailor district operations.

Key areas to consider include:

- **EMIS Manual Revisions**: ODE should work to continue to improve the EMIS manual relative to language, guidance, and searchability;
- **Stakeholder Communication**: ODE should work to continue to improve communications with stakeholders relative to timing of specific requirements;
- **Training Opportunities**: ODE should work to ensure training is appropriate and available for stakeholders, particularly for superintendents and treasurers;
- **Duplicative Data**: ODE should work to remove data reporting requirements that are duplicative in nature or no longer used by ODE; and
- **Customization**: ODE should work to increase opportunities for customization of EMIS reports.

Further, ODE should review the feedback we received from ODE program offices and LEA officials and implement changes to address identified areas of improvement.

Background

The primary purpose of EMIS is to fulfill state and federal legislative requirements for reporting and funding distribution. The system collects data uploaded by LEAs according to standards established by ODE that allow for comparisons between LEAs, as well as analysis of statewide aggregated data. The process steps for EMIS data submission can be summarized into five main steps:

- Step 1: LEAs input data through their local software;
- Step 2: LEAs review and correct errors automatically flagged by the system;
- Step 3: LEAs submit their data;
- Step 4: ODE reviews and verifies all previously accepted data, flagging any errors;[3] and
- Step 5: Data is stored at the Data Warehouse for ODE use.

Step 2 is a data validation check built into the system so that reporting LEAs have an opportunity to review their data and correct flagged errors prior to submission. ODE processes the statewide data on a nightly basis and flags any cross-district issues or issues across multiple reporting periods. EMIS produces various data output reports, including error reports, missing data reports,

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[3] Flagged data is retained in EMIS. LEAs are responsible for reviewing all flags and making data corrections, if warranted.

and detail reports of submitted data.[4] These reports contain flags, warnings, and error messages intended to alert LEAs to potential errors that may need to be corrected. Further quality control is provided by the Ohio District Data Exchange (ODDEX), a system separate from EMIS, which allows LEAs to communicate with one another to resolve cross-district issues that occur when a student's enrollment changes.

ODE had 30 data collection periods throughout the year in FY 2019, varying in length from a month to several months. Some types of data, such as specific student assessments, have one collection period, while others have multiple periods throughout the year, such as student enrollment data. ODE encourages LEAs to regularly update their data, allowing them to address errors as they occur throughout the year. Our stakeholder survey found that the majority of EMIS coordinators update their data in EMIS on a weekly basis. This allows ODE to have access to the most up-to-date data possible, and reduces the number of corrections needed to finalize data after the data collection period closes. A detailed explanation of the data collection periods can be found in **Appendix D**.

Methodology and Analysis

To determine if there are opportunities to improve the accuracy, efficiency, and effectiveness of EMIS data, we examined ODE's process of updating the EMIS Manual and evaluated stakeholder feedback. We interviewed ODE program offices, reviewed recommendation reports published by the EAC, and conducted a statewide survey of LEA officials.

We interviewed nine program offices within ODE on their experiences with EMIS, and asked them to identify any challenges or opportunities for improvement.[5] Interview topics included the EMIS Manual, data collection, federal reporting requirements, and utilization of reports.

To understand the EAC's role in supporting EMIS, we looked at how the Council operates and reviewed their recommendation reports. The EAC meets regularly to review EMIS and discuss issues raised by stakeholders. To develop their first recommendation report, the Council created four workgroups based on the main components of EMIS. Each workgroup identified challenges within their area and selected three or four of those challenges as priorities. The four workgroups are:

- **EMIS Manual and Data Requirements:** Manual instructions and communication of EMIS updates;
- **District Software and EMIS Data Collector:** Which data elements are included in reports;
- **Department Data Processing and ODDEX:** Data reporting; and
- **Reports and Impact:** Understanding report outputs.

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[4] Examples of detail reports include student full-time equivalent (FTE) daily summaries, career-technical education FTEs, current enrollment headcount, expenditures, and Federal Low Income Counts System student enrollment.
[5] From ODE's Center for Teaching, Leading, and Learning, we interviewed Education Effectiveness, Educator Licensure, Career-Technical Education, and Learning and Instructional Strategies. From ODE's Center for Student Supports, we interviewed Early Learning and School Readiness, Integrated Student Supports, and Exceptional Children. From ODE's Center for Continuous Improvement, we interviewed Federal Programs and Improvement and Innovation.

The first EAC report was issued in June 2019 which identified 14 priority and 71 additional challenges associated with EMIS. Each of the challenges was used to develop a recommendation, categorized as a short-term opportunity, long-term opportunity, or both. In June 2020, the EAC issued a second report that provided progress updates to original recommendations and introduced the creation of three additional workgroups to review possible challenges within EMIS, including those identified by the group as well as those raised by other stakeholders. One workgroup was created to research creating a certification program for EMIS coordinators, and the other two are specific to certain reports generated from EMIS.

According to the June 2020 report, four of the original 14 priority recommendations from June 2019, and 17 of the 71 additional recommendations, have been completed. The EAC created a comprehensive list of current and future challenges that can drive efficiency and innovation as the recommendations continue to be implemented.

We conducted a statewide survey of school officials to compare the results with the program office interviews and EAC report, and identify any significant issues that have not been considered by the EAC. Our survey was designed to gain statewide feedback from EMIS coordinators, who are highly invested in EMIS, and LEA administrators, who have varying levels of familiarity with EMIS. Survey questions were developed collaboratively with the OAEP and ODE. These questions were intended to gain insight into how EMIS coordinators use EMIS and assess if they have adequate support to perform their duties related to EMIS.

To evaluate which areas ODE should focus its efforts on to improve the efficiency and effectiveness of EMIS, we compared feedback we received from the program offices to the EAC recommendations and survey responses to identify common themes. We identified the areas that should be a priority for ODE to address, as they were recognized as challenges by multiple stakeholders and are crucial to the effectiveness of EMIS. These areas for improvement generally involve continuing to improve the EMIS Manual, stakeholder communication, training, removal of duplicative or unnecessary data, and customization of reports.

EMIS Manual Revisions

The EMIS Manual is described as a "living document" by ODE. ODE regularly updates the manual in accordance with any changes in federal law, state law, administrative codes, internal policies, or systems design. EMIS users may contact their ITC or ODE directly if they encounter issues in the system or part of the manual that lacks clarity. The EMIS staff in the Office of Data Quality and Governance meet regularly with ODE program offices and the EAC to discuss updates and corrections to the manual. Any changes made are documented within the relevant section, and communicated to LEAs through direct emails to EMIS users and announcements on the ODE website. ODE also publishes an annual EMIS update report showing all changes made to the manual. While ODE has sufficient processes in place to receive and incorporate feedback regarding the manual, our analysis of common themes among various stakeholders found that there are still opportunities to improve the content and how the content is presented and organized.

In their recommendation reports, the EAC found that stakeholders feel there are not enough documents explaining how to report specific, uncommon situations. The Council also noted that searching the EMIS Manual for specific data elements is difficult and the manual should have more hyperlinks to related sections to improve navigation and searchability.

Several program offices noted that the EMIS Manual is difficult to understand and not updated frequently enough. They further explained that there are language issues when trying to understand different reporting requirements written by the federal government, state government, and ODE. Comparison language between these different levels of government would therefore be a helpful addition to the manual.

Our stakeholder survey of EMIS coordinators found the following:

- 87 percent of respondents utilize the EMIS Manual frequently or very frequently;
- 34 percent felt the manual does not offer enough information regarding coding;
- 37 percent felt they were not well informed of updates and changes to the manual; and
- Of those who responded to open-ended questions regarding improvements to the manual, 21 percent requested more examples and 18 percent suggested the manual should be updated more quickly.

Stakeholder Communication

The EAC and program offices generally remarked that stakeholder communication can be improved, especially in regards to the timing of specific reporting requirements. The EAC report commented on a lack of a centralized location for EMIS communications and lack of frequent feedback during the collection periods. It was explained that while last minute extensions to a collection window are helpful, it would be more beneficial if more notice could be given. If data fails to update overnight due to a processing issue, this is not always communicated by ODE. A program office commented that they would like to see a "single source" document that can be ran to see when districts are required to report specific information.

Training Opportunities for Stakeholders

The EAC report had several mentions that school administrators other than EMIS coordinators have a difficult time understanding how EMIS works and how data is used. It was noted that explaining EMIS reports to other district staff is difficult when that staff member has not participated in EMIS reporting training. Staff and administrators who enter data in local software systems often do not have sufficient training to understand how data is used in the Ohio School Report Cards and how it impacts the funding their entity receives. Treasurers struggle to reconcile foundation payments to data reported in EMIS. Further, administrators do not understand the importance of reconciling data when the district is already on the transitional aid guarantee or the gain cap (see **Section 4: State Foundation Payment Process**).

In our survey, 22 percent of EMIS coordinators felt that ongoing training provided by ODE was not adequate. The top responses for areas where additional training is needed were Microsoft Excel and how to interpret specific EMIS reports. When asked if there are barriers to accessing training, the most frequent responses were distance and travel time. Nearly 47 percent felt that

the training they received when they first started as an EMIS coordinator was not adequate to prepare them for the position. Additionally, over 29 percent of superintendents and treasurers feel that there is inadequate training available for them to understand EMIS.

Duplicative or Unnecessary Data
Requiring entities to report duplicative data or data that is not utilized by ODE is not an efficient use of time or resources. The EAC remarked that a large volume of data is required to be reported by districts, so a periodic review of data elements should be conducted to identify items that could be deleted if they are not used or required.

Two program offices that work with federal data noted specific areas where there is duplication of data collected for federal programs. Another program office explained that there is data being collected for areas they no longer monitor. They remarked that entities should be focused on working on data collections that ODE needs.

Customization
Responses from the EAC and the program offices found that customized EMIS reports and a dashboard view of summarized data and reports would help in reducing time spent creating manual data comparisons. In the EAC report, it was noted that EMIS coordinators often need information in one place from multiple reports and staff have to spend too much time manipulating data in spreadsheets before they can efficiently review the data. EMIS includes so much information that it can make it difficult to make sure all important and updated items are being reviewed. Both the EAC report and the program offices recommended adding a dashboard view within EMIS.

Conclusion

A prior performance audit of the Department, released in 2002, included a review of EMIS at the time and found several shortcomings. ODE redesigned the system, and in the past 18 years, had made significant improvements. Our review found that ODE has made changes to EMIS based on stakeholder feedback and the work of the EAC in order to address areas of concern. Many of the issues identified in the 2002 audit have been, or are currently being, addressed by the Department as a result of recommendations made by the EAC.

ODE should continue working to revise and update EMIS, and the associated EMIS Manual, for use by its stakeholders. Strategies for improving EMIS include:

- Improving the user experience with the EMIS manual by adding or improving search functions, hyperlinks to other sections, clarifying language, especially with multiple terms that have the same or similar meaning, and guidance for specific reporting situations;
- More frequent and timely stakeholder communication on reporting requirements and deadlines;
- Evaluating training offerings, particularly those for new EMIS coordinators and for school administrators;

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- Regularly reassessing its data collections and available reports to ensure that reporting entities are not spending excess time on submitting data that is not needed or creating manual comparisons that could be in a report; and
- Creating a dashboard view within EMIS and an option to create custom reports.

Increasing the efficiency of EMIS, and the effectiveness of the EMIS Manual, could provide for improved data accuracy and quicker turnaround times on data reporting submission. This in turn could allow ODE the ability to improve the efficiency of their report generation, and funding time frames (see **Section 4: State Foundation Payment Process**).

Appendix D: EMIS and Data Management

Data Collection Periods

ODE sets data collection periods for data submissions. The data collection periods have varying lengths of time. The shortest window is open for 27 days, and the longest stays open more than a year (375 days). The average window is 166 days or close to 5.5 months of the fiscal year. These collection windows can start any month of the fiscal year (except November and March), and over half of them stay open into the following fiscal year.

The various data collections fall into four major data groupings:
- Main Student Collections;
- Additional Student and Staff/Calendar Collections;
- Assessment Collections; and
- Financial Collections.

The main student data collection dates are divided into three ranges:
- Beginning of the Year collection: September 3, 2019 to December 20, 2019;
- Middle of the Year collection: January 3, 2020 to April 30, 2020; and
- End of Year collection: May 5, 2020 to July 15, 2020.

The full data collection calendar can be assessed at ODE's website.
http://education.ohio.gov/Topics/Data/EMIS/Reporting-Responsibilities/EMIS-Data-Collection-Calendars

Even after the data has been collected and processed, ODE asks the LEAs to review and correct any data shown as being incorrect. Any corrections will process during the nightly collections.

Once the data has been processed, the LEAs can view the data for review purposes utilizing EMIS Reports, ODDEX, and the Ohio Educational Directory System (OEDS).[6]

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[6] OEDS is a decentralized directory data system in which organizations maintain their own data. It is searchable by the general public.