A photograph of two women, one younger and one older, sitting at a table and looking at a laptop. The younger woman is pointing at the screen. The background shows a window with greenery outside. The image is overlaid with a blue gradient.

Frameworks for a Federal Student-Level Data Network:

CONSIDERATIONS FOR USING THE COMMON EDUCATION DATA STANDARDS (CEDS)

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JUNE 2022



INTRODUCTION

Postsecondary education, like other fields, is changing—from programs of study to the students who enroll. But the information available to assess how well institutions serve students has not changed enough to answer critical questions about college access, persistence, success, cost, and post-college outcomes. Federal and state governments also collect this information at varying levels of granularity. To fix these problems, policymakers are considering implementing a federal student-level data network (SLDN), which would overhaul the federal data infrastructure so it includes all students and outcomes, giving a clear picture of student success.

A federal SLDN, like that proposed in the College Transparency Act (CTA),¹ would leverage existing data in federal agencies and from institutions to better understand student trajectories through postsecondary education and shine a brighter light on inequities in outcomes. Legislation like CTA demonstrates a bipartisan interest in ensuring that data collected reflect the experiences of today's students and that students, families, and policymakers have the high-quality information they need to make decisions.² CTA would create a secure, privacy-protected data network within the National Center for Education Statistics (NCES), using strong security standards and data governance protocols. It aims also to streamline burdensome federal reporting requirements for postsecondary institutions, while providing information disaggregated by race, ethnicity, and gender.

As Congress considers this important legislation, organizations with an interest and expertise in postsecondary data and policy have begun to consider what implementation of such a system might entail.³ It is important to consider how to leverage existing systems, workstreams, and frameworks, and coordinate with practitioners and policy thinkers to develop buy-in and highlight potential opportunities and obstacles.

This brief will examine the Common Education Data Standards (CEDS)⁴ as a framework for consideration by the Department of Education, namely NCES, and the Postsecondary Student Data System Advisory Committee (a governing body articulated in the language of the CTA) when determining and aligning data elements and definitions during implementation of the SLDN.

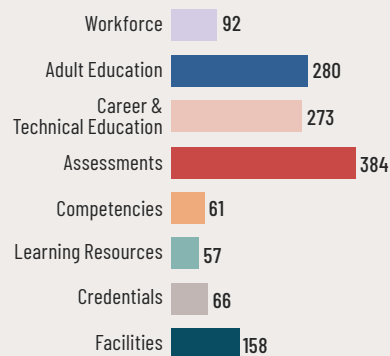
WHAT IS CEDS

CEDS is an education data management initiative whose purpose is to streamline the understanding of data within and across P-20W institutions and sectors. The CEDS initiative, funded by the U.S. Department of Education, includes a common vocabulary, data models that reflect that vocabulary, tools to help the education community understand and use education data, and the education community to discuss the uses of CEDS and expand the development of the standard. As a P-20W data standard, CEDS covers early childhood, K-12, postsecondary, adult education, career and technical education, and workforce-relevant data, with more than 1,700 uniquely defined elements and over 5,000 options or enumerations. For postsecondary education specifically, the CEDS standard includes more than 550 elements,⁵ including facts about the postsecondary organization or institution, student (applicant and enrolled), parent/guardian, staff, and courses.

In addition to definitions and vocabulary related to data elements and metadata, CEDS also includes free tools and resources built to help community members use CEDS to benefit their data systems and associated processes, including:

- **ALIGN.**⁶ A metadata management tool that allows community members to build or upload their data dictionary into a map and align it with CEDS. These maps enable users to share this dictionary publicly so that requesters better understand the data.
- **CONNECT.**⁷ A tool where community members can define and calculate metrics and indicators, helpful in designing policy research questions down to the element level. The tool helps to translate elements and language into that used by other systems and users.
- **INTEGRATED DATA STORE (IDS)**⁸ and expanding **DATA WAREHOUSE (DW).**⁹ Resources that store (IDS) and report on (DW) data based on the CEDS standard.
- **OPEN SOURCE COMMUNITY (OSC).**¹⁰ A hub for CEDS standards development which enables the community (made up of state and local education agency staff, education data solution providers, and education data organizations) to build and modify code, suggest improvements and changes, share solutions, and influence the continued expansion, refinement, and overall impact of CEDS.

Related Postsecondary Domains Elements in CEDS



HOW TO USE CEDS

CEDS community members include education providers (e.g., early learning providers, state education agency staff, local education agency staff, state higher education staff, postsecondary institution staff), education data standards organizations (e.g., A4L, Ed-Fi, Postsecondary Electronic Standards Council), education data solution providers (e.g., student information systems, longitudinal data system providers, system integrators), and national education organizations. Currently, more than 4,000 of them are using CEDS tools and resources via 900 Align maps and more than 1,200 Connections. Fifteen percent of Align maps are postsecondary (an additional 5 percent are P-20W) and 8 percent of Connections are postsecondary. The CEDS resources and tools can meet a variety of needs:

- **DATA SYSTEM INTEGRATION AND DESIGN:** Nearly 1,000 CEDS community members develop Align maps while they are integrating data systems, linking data systems, and moving data from their legacy systems into the IDS. Align’s capabilities allow an interested party to compare its own data dictionary to CEDS, as well as to others in the field.
- **POLICY RESEARCH AND ANALYSIS:** Community members develop connections that define requirements for answering research questions, policy metrics, and federal and state reporting requirements. With a Connection, community members identify which elements are necessary to answer the question and how to put those elements together to conduct an analysis.

For example, Connections are available on all 12 survey components of the Integrated Postsecondary Education Data System (IPEDS) based on the requirements for the 2019-20 reporting year. Institutions can use these Connections to understand the data needed to complete IPEDS reporting. Those institutions which also have an Align map can overlay the map to better understand not only which elements contained within their data systems are needed to complete IPEDS reporting, but also how data in their systems line up with IPEDS requirements.

- **DATA ELEMENT ALIGNMENT:** The IDS contains all 1,700+ elements and is ready for download and installation in a local network. The table structures and fields are derived from the standard itself, enabling a community member to implement a standardized operational data store. More than 25 percent of state education agencies (SEAs) are implementing the IDS, and another 6 percent are building their own data systems based on the CEDS standard. This means almost one-third of K-12 SEA data systems will be using the same language to collect and use their education information, which means that CEDS serves as a model for how the postsecondary ecosystem can move forward with data collection and use.

One benefit of implementing the standardized IDS and Data Warehouse is the scalability and opportunity for collective report-building or sharing to occur. For example, one community member can expand the Data Warehouse and develop scripts for a new report and then share it via the OSC. Because this report is based on the standard, any other member who finds value in the report can download the expanded Data Warehouse and can quickly run the scripts and generate the same report using its own data. The use of shared resources vastly expands the possibilities for data analysis.

How to Expand the CEDS Standard

Over the last 10 or more years, the CEDS standard grew from 161 elements to 1,727 elements¹¹ and expanded from K-12 to the full P-20W spectrum, including elements for assessments, credentials, competencies, learning resources, and facilities. The OSC allows users to submit ideas for expanding the standard at any time. Elements are reviewed and incorporated into the standard throughout the year. This process makes the elements available for use immediately in the IDS. Additionally, on an annual basis, this information is compiled and a new major version of CEDS is available for use in the Align and Connect tools.

When an element is not in CEDS, a community member can lobby to expand the standard by submitting a ticket to the OSC to justify an element's inclusion. Once the ticket is submitted, the entire CEDS community provides input, asynchronously via the CEDS GitHub repository and synchronously via the monthly CEDS OSC meeting. CEDS compiles input in two rounds and modifies the use case accordingly. The user-identified element is then published in the official CEDS standard. Once the element is part of the CEDS standard, modification requires a new ticket to the OSC that will follow the same process.

CTA includes provisions for establishing a postsecondary student-level data network, or SLDN, which seeks to answer questions about student access, progression, success, cost, and post-college and workforce outcomes.

Mapping CEDS to the College Transparency Act

CTA includes provisions for establishing a postsecondary student-level data network, or SLDN, which seeks to answer questions about student access, progression, success, cost, and post-college and workforce outcomes. Data elements specified in the legislation include:

- Elements to fulfill reporting requirements for all “student-related surveys” in IPEDS.¹²
- Measures for all credential levels not currently required for IPEDS reporting, within and across postsecondary institutions related to:
 - Student enrollment
 - Persistence
 - Retention
 - Transfer
 - Completion

SLDN Align Map

These elements include and expand upon those already collected federally in the aggregate through IPEDS. Additional elements, in many cases, mirror those collected by states and other voluntary data initiatives. To better understand whether and how these elements align with those already included in the CEDS standard, the CEDS team coordinated with RTI International,¹³ and found that most of the information (48 out of 53 elements) required for the SLDN already exist at the base element level within CEDS. This means that NCES could leverage these standards when implementing the SLDN.¹⁴ The remaining five elements are being reviewed and use case tickets have been submitted to the OSC to expand CEDS.

Once the CTA is passed into law, the SLDN element set originally defined in *Implementing a Federal Student-Level Data Network: Advice from Experts*¹⁵ will need to be expanded to include identification elements such as postsecondary institution identifier, student identifier, school year, enrollment entry and exit dates, and academic award date. The Postsecondary Student Data System Advisory Committee will ultimately be responsible for developing specific data definitions for these elements.

POLICY IMPLICATIONS

If legislation authorizing a federal SLDN is passed, implementation of the network will be a large but crucial undertaking for the Department, NCES, and postsecondary institutions. Given the close alignment found between CTA's data elements and existing CEDS elements, the standards could serve as a key tool to streamline implementation. Furthermore, work currently underway, like understanding obstacles and opportunities to reforming postsecondary data policy with the education community and understanding how existing frameworks could be applied to such a network, will facilitate a more streamlined and inclusive implementation process. Creation of a federal SLDN opens opportunities to answer key questions about students' pathways and outcomes in postsecondary education and the workforce and illuminates how and whether our education systems are serving students. NCES should consider the tools at its disposal, like CEDS, to facilitate an effective implementation of an SLDN.

Better data and efficient data systems are critical policy levers to building a more inclusive, responsive, and effective postsecondary education system.

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APPENDIX:

POSTSECONDARY STUDENT-LEVEL DATA NETWORK ELEMENTS

The chart below shows where data elements necessary to implement a federal SLDN align with both current IPEDS requirements and elements within CEDS. Please note that, as specific data definitions will be determined during implementation, the alignment below is approximate and sources may have varying degrees of granularity. The CEDS elements can serve as guides for the Department during implementation.

C = Completions
 EF = Fall Enrollment
 E12 = 12-Month Enrollment
 GR = Graduation Rates
 GR200 = Graduation Rates 200%
 IC = Institutional Characteristics
 OM = Outcome Measures
 SFA = Student Financial Aid

Data Element	Current IPEDS Component	CEDS Element(s)	Notes
Whether student was enrolled	EF, E12, SFA, OM, GR/GR200	<u>Postsecondary Enrollment Type</u>	
Attendance intensity	EF, E12, SFA, OM, GR/GR200	<u>Postsecondary Enrollment Status</u>	
Program of study/major	C, EF	<u>Classification of Instructional Program Code</u> , <u>Classification of Instructional Program Version</u>	
Credential-seeking status	EF, E12, SFA, OM, C, GR/GR200	<u>Degree or Certificate Seeking Student</u>	
Student level	EF, E12, SFA, OM, GR/GR200	<u>Student Level</u>	CEDS currently includes undergraduate and graduate level distinctions, but not professional and non-degree levels.
Permanent residence	EF	<u>State of Residence</u> , <u>Address Type for Learner or Family</u>	
Graduated high school within past 12 months	EF	<u>K-12 Transcript Diploma or Credential, Award Date</u> , <u>K-12 Transcript Cohort Year</u>	
Enrolled in distance education	C, EF	<u>Distance Education Course Enrollment</u>	

Data Element	Current IPEDS Component	CEDS Element(s)	Notes
Retention/persistence	EF	<u>Enrollment Entry Date</u>	On the student level, this relates to "Continuing/Returning Student." Closest CEDS match is deriving from Enrollment Entry Date—if this date is in a previous AY, the student is "persisting."
Transfer	EF, GR/GR200, OM	<u>Postsecondary Enrollment Type</u>	
Enrollment status (first-time, recent transfer, other non-first-time)	EF, GR/GR200, OM, SFA	<u>Postsecondary Enrollment Type</u>	
First time at this institution	EF, GR/GR200, OM, SFA	<u>Enrollment Entry Date</u> , <u>Postsecondary Enrollment Type</u>	
Participation in remedial coursework		<u>Developmental Education Type</u>	
COMPLETION			
Credential conferred	C, GR/GR200, OM	<u>Academic Award Level Conferred</u>	
Completed within 100% of normal time	GR/GR200	<u>Normal Length of Time for Completion</u> , <u>Program Participation Start Date</u> , <u>Academic Award Date</u> , <u>Academic Award Level Conferred</u>	
Completed within 150% of normal time	GR/GR200	<u>Normal Length of Time for Completion</u> , <u>Program Participation Start Date</u> , <u>Academic Award Date</u> , <u>Academic Award Level Conferred</u>	
Completed within 200% of normal time	GR/GR200	<u>Normal Length of Time for Completion</u> , <u>Program Participation Start Date</u> , <u>Academic Award Date</u> , <u>Academic Award Level Conferred</u>	
When award was conferred	C, GR/GR200, OM	<u>Academic Award Date</u>	
CIP or awarded major(s)	C	<u>Classification of Instruction Program Code</u>	
FINANCIAL AID			
Pell Grant	GR, OM, SFA	<u>Financial Aid Award Type</u> , <u>Financial Aid Award Amount</u>	
Other federal grants		<u>Financial Aid Award Type</u> , <u>Financial Aid Award Amount</u>	
State/local grants	SFA	<u>Financial Aid Award Type</u> , <u>Financial Aid Award Amount</u>	

Data Element	Current IPEDS Component	CEDS Element(s)	Notes
Institution grants	SFA	<u>Financial Aid Award Type</u>	
Grants from third parties (private)	SFA	<u>Financial Aid Award Type</u> , <u>Financial Aid Award Amount</u>	
Federal loans	GR, SFA	<u>Financial Aid Award Type</u> , <u>Financial Aid Award Amount</u>	
Nonfederal loans	SFA	<u>Financial Aid Award Type</u> , <u>Financial Aid Award Amount</u>	
In-state/out-of-state tuition flag	SFA	<u>Tuition Residency Type</u>	
Title IV flag	SFA		There is no corresponding CEDS element.
Post-9/11 GI Bill	SFA	<u>Financial Aid Veteran's Benefit Type</u> , <u>Financial Aid Award Amount</u>	
DOD TA aid	SFA	<u>Financial Aid Veteran's Benefit Type</u> , <u>Financial Aid Award Amount</u>	
Military or veteran benefit status	SFA	<u>Financial Aid Veteran's Benefit Status</u>	
Cumulative student debt			There is no corresponding CEDS element and IPEDS does not collect this information.
Loan repayment status			There is no corresponding CEDS element and IPEDS does not collect this information.
Repayment plan			There is no corresponding CEDS element and IPEDS does not collect this information.
DEMOGRAPHICS			
Age	C, EF	<u>Birthdate</u>	Calculate age based on time period and birth date.
Gender	C, EF, E12, GR/GR200, OM, SFA	<u>Sex</u>	CEDS has defined sex, but not gender.
Race	C, EF, GR/GR200, OM	<u>American Indian or Alaska Native</u> , <u>Asian</u> , <u>Black or African American</u> , <u>Native Hawaiian or Other Pacific Islander</u> , <u>White</u> , <u>Demographic Race Two or More Races</u>	

Data Element	Current IPEDS Component	CEDS Element(s)	Notes
Ethnicity	C, EF, GR/GR200, OM	<u>Hispanic or Latino Ethnicity</u>	
First-generation college student status		<u>First Generation College Student</u>	
Economic status		<u>Financial Need</u>	
Veteran status		<u>Military Veteran Student Indicator</u>	
Military status		<u>Military Active Student Indicator</u> , <u>Military Branch</u>	
Household income	SFA	<u>Financial Aid Income Level</u>	
Living arrangement	SFA	<u>Campus Residency Type</u>	
POST-COMPLETION OUTCOMES			
Aggregate earnings, by institution and program		<u>Quarterly Earnings</u>	The legislation is not prescriptive about the source or frequency with which data about earnings are collected. This could align, but if a different frequency of earnings is requested, then a new element will need to be added to CEDS.
Employment		<u>Employed After Exit</u>	
Occupation		<u>Standard Occupational Classification</u>	
Further education			There is no corresponding CEDS element and IPEDS does not collect this information.
INSTITUTION CHARACTERISTICS			
Institution level	IC	<u>Level of Institution</u>	
Institution control	IC	<u>Control of Institution</u>	
Predominant degree awarded	IC	<u>Classification of Instructional Program Code</u>	
Cost of attendance	SFA	<u>Price of Attendance</u>	
UNIQUE STUDENT IDENTIFIER			
Student ID		<u>Student Identifier</u> , <u>Student Identification System</u>	

Endnotes:

- 1 College Transparency Act Text, S. 839, 117th Cong. (2021, March 18), <https://www.congress.gov/bill/117th-congress/senate-bill/839/text>
- 2 Bussey, K., Roberson, A. J., & Voight, M. (2019, January), Better data on the horizon: An analysis of evolving student-level data legislation, Institute for Higher Education Policy, https://sites.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/sldn_legislative_comparison_memo_january_2019.pdf
- 3 Other examples of this work include a collaboration between RTI International and the Institute for Higher Education Policy, which includes a series of forums and briefs. For more information see [Implementing a Federal Student-level Data Network: Advice from Experts](#), [Implementing a Federal Student-level Data Network \(Part II\): Insights from Institutional Representatives](#) and [Implementing a Federal Student-level Data Network \(Part III\): Insights from Financial Aid Experts](#)
- 4 Common Education Data Standards (CEDS), <https://ceds.ed.gov/>
- 5 CEDS contains 1,725 unique elements. However, in the CEDS domain entity schema elements may appear multiple times because they appear for each possible instance. For example, “First Name” appears 22 times to cover student, staff, and parent across each educational sector. This results in 3,883 CEDS elements. The numbers represented for postsecondary education and its related domains are part of the 3,883 elements.
- 6 Common Education Data Standards (CEDS), Align, <https://ceds.ed.gov/align.aspx>
- 7 Common Education Data Standards (CEDS), Connect, <https://ceds.ed.gov/connect.aspx>
- 8 CEDS Integrated Data Store (IDS), GitHub, <https://github.com/CEDStandards/CEDS-IDS>
- 9 Common Education Data Standards (CEDS) Data Warehouse, GitHub, <https://github.com/CEDStandards/CEDS-Data-Warehouse>
- 10 Common Education Data Standards (CEDS), GitHub, <https://github.com/CEDStandards>
- 11 Common Education Data Standards (CEDS), Development Timeline (2021), <https://ceds.communities.ed.gov/#communities/pdc/documents/20643>
- 12 IPEDS “student-related surveys” is defined for this analysis as Completions, Fall Enrollment, 12-month Enrollment, Graduate Rate, 200% Graduation Rate, Institutional Characteristics, Outcome Measures, and Student Financial Aid. IPEDS surveys not included are Admissions, Academic Libraries, and Human Resources.
- 13 RTI International and the Institute for Higher Education Policy collaborated with field experts to develop the set of data elements required to calculate all of the indicators included in proposed SLDN legislation. For more information, see [Implementing a Federal Student-Level Data Network: Advice from Experts](#).
- 14 See Appendix for the full analysis of elements. Common Education Data Standards (CEDS). College Transparency Act’s Proposed Student Level Data Network (SLDN) map, <https://ceds.ed.gov/Map-SHare.aspx?mapId=13322&shareId=10da14b6-7163-4b58-9389-484b8f193589>
- 15 Dunlop Velez, E., Pretlow, J., & Roberson, A. J. (2020, August). Implementing a federal student-level data network: Advice from experts, <https://www.ihep.org/publication/implementing-a-federal-student-level-data-network-advice-from-experts/>

NOTES



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