What's New in Ed-Fi® v1.2

An Overview of Changes and Enhancements

Ed-Fi Version 1.2

11/7/2013

For the latest information about the Ed-Fi Alliance, visit our website at www.ed-fi.org.

Contents

Introduction

This document provides an overview of major changes to the Ed-Fi® standard and tool suite comprising the Ed-Fi Version 1.2 release. The majority of enhancements in Ed-Fi Version 1.2 are the result of feedback from real-world implementations by the Ed-Fi community.

Several new enhancements in Ed-Fi Version 1.2 deliver increased or entirely new functionality to licensees. These enhancements include design guidelines for implementing a REST[1] Application Programming Interface (API) based on the Ed-Fi data model, dashboard accessibility and user interface enhancements in the Ed-Fi tool suite, updates for Common Education Data Standards (CEDS)[2] 3.0 alignment and the availability of the online Ed-Fi validation tool.

The Ed-Fi Alliance transparently manages enhancements and changes to the solution, and provides a variety of ways for interested parties to participate, including a website feedback form and a Request for Comment period preceding each new version release. In addition, recommended changes and issues are captured, tracked and made visible in the Ed-Fi Alliance GitHub® repository, which is accessible to Ed-Fi solution licensees.

When appropriate, this document traces changes back to requests or issues raised by the Ed-Fi community as logged in the project's GitHub repository. A notation (e.g., Issue ##) refers to a specific issue number.

---

[1] Representational State Transfer (REST), http://en.wikipedia.org/wiki/Representational_state_transfer
[2] Common Education Data Standards, http://ceds.ed.gov

Audience

This document is designed to provide an understanding of the changes made for Ed-Fi Version 1.2 for those who have already adopted Ed-Fi Version 1.1 and v1.1.1, and to help those considering Ed-Fi Version 1.2 adoption to better understand the rationale behind recent additions to the data standard.

Prerequisites

To gain the most benefit from this information, the reader should already be familiar with the following knowledge areas:

- The Ed-Fi solution, see www.ed-fi.org
- Extensible Markup Language (XML), see www.w3.org/XML
- XML Schema (XSD), see en.wikipedia.org/wiki/XML_Schema_(W3C)
- Unified Modeling Language (UML) as applied to conceptual data modeling, see en.wikipedia.org/wiki/Unified_Modeling_Language
- Data Modeling, see en.wikipedia.org/wiki/Data_modeling

For more information about these topics, see the preceding links.

Updates to the Ed-Fi Tool Suite

The Ed-Fi tool suite comprises a dashboard starter kit–including sample dashboard views and metrics that define performance management indicators; an Operational Data Store (ODS) reference implementation–including a relational database schema and Extract, Transform and Load (ETL) packages; sample data and extensive documentation. This section highlights the most significant enhancements made to the materials in the Ed-Fi tool suite from v1.1.1 to v1.2. A more extensive list of enhancements and fixes is documented in the "Appendix B: Details of Updates to the Ed-Fi Tool Suite" section in this document.

Dashboard Enhancements

Enhancements incorporated from implementations into this release include:

- Accessibility enhancements supporting Americans with Disabilities Act (ADA) compliance
- User interface "skins"
- Photo upload capability
- New dashboard metrics.

Accessibility Enhancements and Skinning Capability

Incorporating the ADA and Section 508 compliance modified not only the dashboards' appearance, but also the underlying structure of the code. In order to enhance accessibility, the following key features have been added while refactoring the dashboards:

- Web page structure redesigned to improve machine readability by screen reader software
- Keyboard navigation capability enhanced
- Objects and background colors adjusted by standard ratios to carefully contrast for some types of visual impairment
- Hidden tabular interpretations of graphic data and descriptive alternative text included in graphic charts
- In order to implement accessibility enhancements, a user-interface skinning framework was established. As a result, it is now much easier to customize the look and feel of the dashboards by creating or using custom skins.

(Contributed by the Texas Education Agency)

Photo Upload Capability

The photo upload capability enables the import of student and staff photos for display in the Ed-Fi-powered dashboard using a simple, web-based interface.
(Contributed by the Arkansas Department of Education)

New Metrics Added

For v1.2, 128 new metrics have been added. These additions are summarized below:

- End of Course Commended Performance and Exams results metrics of State Standardized Assessments in subjects such as ELA, Algebra, Geometry, History, Biology, Social Studies and Physics at Student, School and LEA levels, including measures of non-participation
- College Entrance Exams metrics for College and Career Readiness such as EXPLORE®, PLAN®, ACT® and EPAS® at Student, School and LEA levels
- English Language Development Assessment metrics at Student, School and LEA levels for Kindergarten to 12th grade, where applicable
- Benchmark Assessments metrics for Learning Standard Mastery on Core Subject Areas such as ELA/Reading, Mathematics, Science and Social Studies at LEA level
- Repeat State Assessment Failures for Writing metric at School level

(Contributed by the Texas Education Agency and the Delaware Department of Education)

ETL Enhancements

Import Dashboard Types

Metrics have metadata that the dashboard application uses to render the content of metric values in the user interface (UI). The Import Dashboard Types ETL package is a new component in the solution that loads all the metrics required to display the dashboards. This process enables licensees to manage metric metadata without modifying the database tables directly, as was required in previous versions of the Ed-Fi solution.

(Contributed by the Ed-Fi Alliance Team)

Upgrade to SQL Server™ Integration Services 2012

Until v1.1.1, SQL Server Integration Services (SSIS) 2008 was used for the Ed-Fi ETL packages. Starting with v1.2, these ETL packages upgraded to SSIS 2012. This decision was driven by the opportunity to leverage new features in SSIS 2012 to ease the ability of licensees to upgrade to new versions of the Ed-Fi solution.

While SSIS 2012[3] is required for ETL servers, database servers may use either SQL Server 2008 R2 or SQL Server 2012.

(Contributed by the Ed-Fi Alliance Team)

Updates to the Ed-Fi Data Standard

This section describes the changes made to the Ed-Fi data standard from v1.1.1 to v1.2. The most significant changes made to the Ed-Fi data standard from v1.1.1 to v1.2 are highlighted. A more detailed description of changes to the Ed-Fi data standard is provided in the "Appendix A: Data Model Changes by Domain" section in this document.

CEDS 3.0 Alignment

The Common Education Data Standards (CEDS) is a collaborative effort between the U.S. Department of Education and other federal agencies, State Education Agencies (SEAs), Local Education Agencies (LEAs), private foundations and vendors to create a common vocabulary for education data, thereby streamlining data exchange and facilitating comparison across institutions and sectors.

---

[3] Microsoft® has released Service Pack 1, a required update to SQL Server 2012, http://www.microsoft.com/en-us/download/details.aspx?id=35575

In January 2013, this collaborative effort released the third version of its data standard−CEDS 3.0−containing 289 new elements, including additions to Early Learning, K–12 and Post-Secondary. The group also released tools to show how data systems and standards align to CEDS 3.0 and, using CEDS 3.0 as the common mapping, how they align to each other. Currently, over 50 such systems and standards, including the Ed-Fi standard, have used the tool to define their alignment to CEDS 3.0.

The Ed-Fi Alliance has participated in CEDS from the beginning and actively supports improvements to each CEDS release. In addition, Ed-Fi implementers have shown great interest in CEDS. As a result, a major theme driving Ed-Fi v1.2 development has been ensuring alignment of the Ed-Fi data standard to CEDS 3.0. Each element added in CEDS 3.0 was considered for addition in Ed-Fi v1.2[4]. During this analysis, four questions were asked on each new CEDS 3.0 element:

1. Does the CEDS 3.0 element have a common use within the K–12 information domain around which the Ed-Fi standard centers? If the CEDS element is from the pre-K, postsecondary or workforce domains, is it commonly used in K–12 (e.g., assessing readiness of entering students or assessing the outcomes of K–12 graduates)?
2. Does the CEDS 3.0 element already exist in the Ed-Fi data model or can the CEDS 3.0 element be derived from existing Ed-Fi elements?
3. Does the CEDS 3.0 element help to further the current or future purpose of the Ed-Fi data model?
4. How would the CEDS 3.0 element fit into the existing Ed-Fi data model and what is the impact of this change?

_____

[4] For further details of the philosophy followed on this alignment, please refer to the CEDS 3.0 Alignment Approach for Ed-Fi v1.2 document, available at http://www.ed-fi.org/tech-docs.

The following approach was taken to closely align Ed-Fi v1.2 with CEDS 3.0:

- Perform a conceptual mapping between every element in CEDS and the Ed-Fi data standard, obtaining:
  - Existing elements on both standards
  - Elements in CEDS to be analyzed for inclusion in the Ed-Fi data standard
  - Elements in the Ed-Fi data standard to be analyzed for inclusion in CEDS
- Incorporate K–12 additions as appropriate
  Note: CEDS 3.0 incorporates many elements and enumerations from the Ed-Fi data standard.
- Re-align w values that changed in CEDS 3.0, now including definitions
- Expand the scope of existing Ed-Fi domain entities to support early childhood and postsecondary CEDS domains
- Include Federal Funds and Accountability elements for State and Local Education Agencies to provide organizations that already have this aggregated data available the option to use granular source data or computed data for those included ratings

Early Learning and Post-Secondary Domains

CEDS defines early learning as "the stage in human development from birth through the early school years, during which significant social, emotional, cognitive, language, psychological and physical development occurs."

Derived from the current model for the K–12 scope, the effort consisted of identifying if this domain:

- Uses concepts similar to Class Periods, Sessions and Sections
- Can leverage the current Ed-Fi model behind the Assessments, Attendance and Interventions

Early Learning institutions are meant to provide support for children's development and assess whether the child is ready for school or requires improvement on specific areas. In practice, learning groups at this stage are

not as complex as the K–12 structure currently modeled in the Ed-Fi standard and assessments are often based on staff's discretional evaluation instead of the assignment of a numeric grade.

As opposed to K–12 schools, children in Early Learning institutions are primarily enrolled by program. At this education level, the programs are not clearly defined by academic subject, meaning that the same teacher or staff member is responsible for the learning group and its development over multiple instructional content domains and, in most of the cases, in the same classroom.

Given this, the Ed-Fi standard leverages much of its existing K–12 model, varying slightly to account for early learning use cases by extending the following concepts:

- Support for Assessments: Optional reference added from Program to Assessment
- Support for Attendance: Optional reference added from Program to AttendanceEvent
- Support for Student Competency: Optional reference added from Program to StudentCompetency
- Support for the use of Learning Standard and Learning Objectives: Optional reference added from LearningStandard and from LearningObjective to Program

Additionally, the attributes from CEDS Early Learning were added to:

- Assessments
- Staff
- EducationContent
- Program

For the CEDS Post-Secondary domain, the Ed-Fi PostSecondaryEvent was expanded. The PostSecondaryEvent's Event Categories now include remedial

enrollment in ELA and Math. This is useful information for the K–12 system from which post-secondary students originate.

The attributes of the Post-Secondary Institution are included in PostSecondaryEvent. This information is helpful in tracking post-graduation statistics for the K–12 system from which post-secondary students originate.

Teacher-Student Data Link

To provide support for the CEDS Teacher-Student Data Link (TSDL)[5] elements, the TeacherStudentDataLinkExclusionFlag element is now included in the Ed-Fi data standard.

By default, every entry in the StudentSectionAssociation joined to TeacherSectionAssociation semantically establishes a teacher-student link. The TeacherStudentDataLinkExclusionFlag is placed on the StudentSectionAssociation, giving granular control of which students may be excluded from being associated with a teacher.

Additionally, the same attribute is reused on the TeacherSectionAssociation if the entire section is excluded from being associated with a teacher.

The PercentageContribution attribute defines the contribution of a staff member to a student's education in a given section.

---

[5] The TSDL is an opt-in effort of the NCES Teacher-Student Data Link Working Group; see http://nces.ed.gov/forum/student_educator.asp for more information.

Federal Funds and Accountability

The data elements from the Federal Funds and Accountability entities in CEDS were analyzed from the K–12 perspective and a subset of those CEDS elements are included.

AccountabilityRatings is used at the EducationOrganization level, meaning that a rating can be specified at School, LocalEducationAgency or State level, or aggregated from bottom to top. In contrast, Federal Funds and Accountability elements are more specific on LEA and SEA level, and the elements were added according to their corresponding place in CEDS. As a result, four new attributes were added to the Ed-Fi data standard:

- LocalEducationAgencyAccountability
- LocalEducationAgencyFederalFunds
- StateEducationAgencyAccountability
- StateEducationAgencyFederalFunds

FederalFunds are periodically updated based on fiscal year. Accountability is updated based on school year, which can differ from the fiscal year. In each case, the elements included are not meant to compose an entire accounting system, but rather they are intended to be informational about the activities and performance of the institutions.

Alignment of AcademicHonor, Diploma and Recognition

CEDS models general Achievement to cover use cases that the Ed-Fi data standard has modeled separately as AcademicHonor, Diploma and Recognition.

The CEDS model satisfies the same concept, but the existing entities in the Ed-Fi data standard each have additional information particular to each type of Achievement. In order to align to CEDS, the Achievement entity was added

as a generalization of AcademicHonor, Recognition and Diploma, holding only those common elements. As a result, the Ed-Fi data standard retains the needed differentiation, while aligning with the CEDS Achievement concept.

Improved Bell Schedule Model

In Ed-Fi v1.x[6], the bell schedule model defines the structure of the Bell Schedule by creating a template for a week and then using the WeeksInCycle attribute to define how the pattern is repeated, forming the schedule by computation.

In Ed-Fi v1.2, the new bell schedule model defines specifically the CalendarDates and GradeLevels for which a Bell Schedule applies. This model is less complex, while providing the flexibility for schedules to differ on specific days.

With this model, it is also possible to know the Bell Schedule applied on a particular date without computation.

Student Information and Demographics Domain

In order to expand and improve upon the student profile information in the Ed-Fi solution, new elements were added to include additional information regarding identity, languages, citizenship, contact and migrant information.

For identity, the PersonalIdentificationVerification is expanded to include IdentificationDocument, which also specifies citizenship information. This PersonalIdentificationVerification contains a set of document categories as values to specify the type of document used for identification.

---

[6] The notation v1.x is used in this document to refer to both Ed-Fi Version 1.1 and Version 1.1.1.

In the previous version, the LanguagesDescriptor specifies the languages a Student uses and identifies the HomeLanguage−a language specifically used to communicate at home−separately. To support flexibility for other uses of the language information in the Ed-Fi data model, the LanguageUseDescriptorReferenceType is created, allowing it to specify multiple uses−home, native, written−for each language that a Student uses to communicate.

Citizenship is a new element in v1.2 and includes: the status of a person (student or staff), the visa type for non-citizens and the documentation provided for identification of U.S. or foreign citizenship.

Elements related to migrant students, including dates for entry into the United States and entry into a school in the United States are included in the StudentMigrantEducationProgramAssociation. These additions are not attached directly to the Student, since this information only becomes relevant upon enrollment in a Migrant Education Program. In contrast, due to general applicablility, InternationalProvinceOfBirth, which indicates the precise birthplace of a Student, has been added to birth data.

REST API Design Guidelines

This version of the Ed-Fi solution includes published design guidelines for implementing a REST API based on the Ed-Fi data model. Such an API provides transportation and manipulation of information as resources that are elements defined in the Ed-Fi Unifying Data Model (UDM). While the guidelines cover the entire UDM, an implementation of this API is not required in order to implement the full Ed-Fi data model.

Some important features of the API are:

- Supports high volumes of data throughput by using an optimistic concurrency model
- Protects resources using complex security models by using tokens and user-level access algorithms
- Complies with FERPA regulations regarding authorization to resources

For more information on the Ed-Fi REST API, please refer to the *Ed-Fi REST API Design Guidelines* document.

Online Validation Tool

To better enable high-quality solutions for the education sector, the Ed-Fi Alliance now offers vendors an online validation tool. The tool allows vendors to ensure interoperability and successful data exchanges among multiple education data systems.

This tool enables near-instant validation checks of data files created according to the Ed-Fi data standard. It helps vendors ensure the quality, interoperability and compatibility of tools and products that employ the Ed-Fi standard, and helps ensure that any data exchanged is valid. Vendors no longer have to create their own tool or identify another validation tool compatible with their products. Thus, the Ed-Fi validation tool saves vendors time and money with each student data system implementation.

States and school districts also reap the benefits of the validation tool. It is one less expense of a new data system and frees resources that would have been spent on validation to be invested in other priority projects.

The validation tool:

- Reduces implementation time and costs
- Validates FERPA-compliant data files against Ed-Fi standard interchange schemas and select business rules
- Provides a user-friendly, lightweight web-based interface for vendors
- Deletes test files upon conclusion of each test

For guidance on utilizing the validation tool, please refer to the Validation Tool Getting Started guide on http://www.ed-fi.org/tech-docs.

Version Support Strategy

Backward compatibility is now included in the ETL packages that load data from XML interchange files to the Operational Data Store. The ETL packages support the ingestion of both Ed-Fi v1.x and Ed-Fi v1.2 XML interchange files. Following this principle, the next version of the Ed-Fi solution will support ingestion of v1.2 XML interchange files.

Appendix A: Data Model Changes by Domain

This section describes changes made to the Ed-Fi data model from Ed-Fi v1.x to Ed-Fi v1.2, along with a rationale for the change[7]. Backwards compatibility is noted where appropriate.

Global

Change	Rationale
Added annotations/definitions for Enumeration Values [Issue 76]	Enumeration definitions are important to a user of the Ed-Fi data standard mapping their own enumeration values to Ed-Fi enumeration values.

Assessment Domain

Change	Rationale
Added elements • Added optional Author to ContentStandardType, for Assessment • Added optional URI to ContentStandardType, for Assessment • Added optional ProgramReference to Assessment [Issue 4] • Added optional ExpectedTimeAssessed to AssessmentItem • Added optional EventCircumstance to StudentAssessment • Added optional EventDescription to StudentAssessment • Added optional Description to ObjectiveAssessment • Added optional DescriptiveFeedback to StudentAssessmentItem • Added optional TimeAssessed to StudentAssessmentItem • Added DescriptorReferenceType for LanguageDescriptor to Assessment, AssessmentFamily and EducationContent [Issue 147]	Aligned to CEDS 3.0.

---

[7] Access to details referenced by the hyperlinked issues in this section are only available to Ed-Fi solution licensees that have requested access to the Ed-Fi Alliance repository on GitHub.

Change	Rationale
Dropped self-join relationship on ObjectiveAssessmentItem [Issue 36]	The ODS contained an unnecessary self-join relationship on ObjectiveAssessmentItem that was added in Ed-Fi v1.1.
Renamed from ObjectiveAssesmentItem to ObjectiveAssessmentItem [Issue 105]	The ObjectAssessmentItem entity was misnamed in the ODS.
Removed StudentObjectiveAssessmentReference [Issue 153]	Removed ambiguity in the meaning of StudentAssessmentItem's cardinality.

Bell Schedule Domain

Change	Rationale
Bell Schedule alternate model [Issue 38]	Improved definition of a schedule while still providing the functionality allowing multiple schedules for the same School.

Discipline Domain

Change	Rationale
Changed DisciplineActionLength definition to specify length in School Days [Issue 60]	Clarified semantics of DisciplineActionLength in DisciplineAction to mean school days, not calendar day.
The attribute name changed from AssesmentItem to AssessmentItem on AssessmentItem table in the ODS The effect of this change was propagated through the following child tables: • AssessmentItemLearningStandard • ObjectiveAssessmentItem • StudentAssessmentItem [Issue 126]	AssessmentItem attribute was misspelled on AssessmentItem table in the ODS.

Change	Rationale
Deprecated SecondaryBehavior from DisciplineIncident [Issue 138]	With the Ed-Fi Version 1.1 release of descriptors, the SecondaryBehavior attribute on DisciplineIncident and StudentDisciplineIncidentAssociation is obsolete, as the BehaviorDescriptor can fully define the incident.
Added optional RelatedToZeroTolerancePolicy to DisciplineAction	Aligned to CEDS 3.0.

Education Organization Domain

Change	Rationale
Incorporated Federal Funds • Added new attribute StateEducationAgencyFederalFunds • Added new attribute LocalEducationAgencyFederalFunds [Issue 6] Incorporated Accountability • Added new complex type StateEducationAgencyAccountability • Added new complex type LocalEducationAgencyAccountability [Issue 7] Added EmployedWhileEnrolled to StudentSchoolAssociation	Aligned to CEDS 3.0.
Incorporated new enumeration values to EducationOrgIdentificationSystemType	In order to reuse the EducationOrgIdentificationSystemType type in the new PostSecondaryInstitution complex type, new enumeration values were added for Post-Secondary institutions: • IPEDS for *Integrated Post-Secondary Education Data System* • USDE – OPE for *U.S Department Of Education's Office of Post-Secondary Education*

Enrollment Domain

Change	Rationale
Added EntryGradeLevelReason to StudentSchoolAssociation [Issue 149]	CEDS defines the Promotion and Non-Promotion Reason elements to specify the nature of the student's progress in a school term and the primary reason that a Student should or should not be promoted. Since Students cannot be promoted and non-promoted at the same time, this was incorporated as a reason of entry to the new grade level in StudentSchoolAssociation.

Graduation Domain

Change	Rationale
Expanded PostSecondaryEvent • Added enumeration values for Remedial Courses to PostSecondaryEventCategory enumeration • Added PostSecondaryInstitution complex type to PostSecondaryEvent, migrating NameOfInstitution and InstitutionId (replaced by the EducationOrgIdentificationCode type) [Issue 5]	Aligned to CEDS 3.0.

Intervention Domain

Change	Rationale
Merged LearningResourceMetadata into EducationContent [Issue 30]	The LearningResourceMetadata entity is separated so it can be reused. However, the only use cases identified can be modeled using EducationContent; therefore, LearningResourceMetadata elements have been merged into EducationContent.
Renamed InterventionDiagnosisType table to InterventionDiagnosisDescriptor [Issue 164]	When DiagnosisType was changed to DiagnosisDescriptor in v1.1, the InterventionDiagnosisType table name was not changed. This change is consistent with the naming conventions.

School Calendar Domain

Change	Rationale
Added new enumeration values to TermType [Issue 12]	Previously, TermType could not define terms occurring more frequently than three times per year. In addition, including TermTypeId in the primary key of Session limited an educational organization to no more than one MiniTerm term type per school year. As a result, TermType has been expanded to include quarters.

Special Education Domain

Change	Rationale
Removed ReasonExitedDescriptorId from StudentSpecialEdProgramAssociation [Issue 163]	ReasonExitedDescriptorId on StudentProgramAssociation and StudentSpecialEdProgramAssociation tables in the ODS were separate enumerations; when moved to a descriptor in Ed-Fi v1.1, this difference no longer existed.

Staff Domain

Change	Rationale
Added elements • Added optional StateOfIssue to Staff • Added value to LevelOfEducation enumeration for HighestLevelOfEducationDescriptor in Staff [Issue 40] • Added optional HourlyWage to StaffEducationOrgEmploymentAssociation	Aligned to CEDS 3.0.

Student Academic Record Domain

Change	Rationale
Additions • Added optional TimeRequiredForCompletion to Course • New Achievement as generalization of Academic Honor, Diploma and Recognition. • Added optional AwardExpiresDate to AcademicHonor, Diploma and Recognition • Added optional DiplomaDescription to Diploma • Added optional ProgramReference to StudentCompentency [Issue 4]	Aligned to CEDS 3.0.
Added GradebookEntryTitle to GradebookEntry [Issue 16]	The GradebookEntry entity was not modeled to support multiple assignments per day. To ensure the uniqueness of multiple assignments in a given day, the GradebookEntryTitle has been added.
Fixed spelling error in the ODS model on ReportCardStudentCompetencyLearningObjective [Issue 49]	Alternate "Competency" spelling was removed from XSD but not the Operational Data Store.
Increased cardinality for Diploma on StudentAcademicRecord from 0..1 to 0..* [Issue 56]	Diploma on StudentAcademicRecord had cardinality 0..1, which means only one diploma could be awarded for a given session. Given the semantics of "diploma,"−more than one can be awarded in the same session−the cardinality has been increased.
Changed HonorAwardDate in AcademicHonors table to be optional in the ODS and UML [Issue 143]	The XSD shows HonorAwardDate as optional but the ODS and UML have it as required.

Student Attendance Domain

Change	Rationale
Added optional ProgramReference to AttendanceEvent [Issue 4]	Relates the program associated with the attendance event; used for Early Learning attendance.
Removed "Absence" enumeration value from AttendanceEventCategoryType [Issue 23]	With CEDS 2.0 alignment in Ed-Fi v1.1, new enumeration value of "Absence" was added to the absence category. Using this value breaks the StudentAttendanceMetric ETL package, which needs to know the type of absence−excused or unexcused.
Extended the DescriptorReferenceType for LanguageUseDescriptorReferenceType [Issue 90]	Aligned to CEDS 3.0.
Added AssigningOrganizationCode to the primary key of StudentIdentificationCode [Issue 28]	When using StudentIdentificationCode, it is not possible to have two IdentificationCodes for the same StudentIdentificationSystem. AssigningOrganizationCode has been added to the primary key and the ETL will default the AssigningOrganizationCode to the StudentIdentificationSystem value.
Added new complex type for Person's Identification and Citizenship [Issue 142]	To address the use-case of Student and Staff citizenship and documents and visas, IdentificationDocument has been added to the Ed-Fi standard.
Added new elements to improve Student data fields Expanded StateOfBirthAbbreviation for international births Added dates to specify first and most recent entry to the U.S. and date of school entry [Issue 90]	Satisfied additional elements requested by licensees.

Change	Rationale
Added new elements • Added optional SuccessCriteria to LearningStandard and LearningObjective • Added optional InstructionLanguage to Section	Aligned to CEDS 3.0.
Added optional Teacher Student Data Link support • TeacherStudentDataLinkExclusionFlag • PercentageContribution [Issue 3]	StudentSectionAssociation and TeacherSectionAssociation define the link between Teacher and Student through Section enrollments and assignments. TeacherStudentDataLinkExclusionFlag is included in both associations to control whether the Section or the Student are excluded from teacher evaluation computation or not. The PercentageContribution defines the level of involvement of a Staff member in a learning process.
Added optional LearningStandardReference and LearningObjectiveReference to Program [Issue 4]	Defines the Learning Standard/ Objective followed by this program for Early Learning support
Added optional SchoolYear to TeacherSchoolAssociation [Issue 9] [Issue 52]	Supports the storage of multiple school years' worth of assignments

Change	Rationale
Added ProgramName to Program Due to key migration, the following related tables were modified: • CohortProgram • Program • ProgramService • RestraintEventProgram • SectionProgram • StaffProgramAssociation • StudentCompetencyLearningObjective • StudentCompetencyObjective • StudentCTEProgramAssociation • StudentMigranEducationProgramAssociation • StudentProgramAssociation • StudentProgramAssociationService • StudentProgramAttendanceEvent • StudentSpecialEdProgramAssociation • StudentSpecialEdProgramAssociationServiceProvider • StudentTitleIPartAProgramAssociation Additionally, the following new tables reflect this modification: • AssessmentProgram • ProgramCharacteristics • ProgramLearningObjective • ProgramLearningStandard [Issue 14]	To implement Program in the ODS, the primary key was EducationOrganizationId and ProgramType, preventing more than one per EducationOrganization (e.g., Athletics, which could be more specific: Basketball, Baseball, Cheerleading). This forced implementers to extend the ProgramType enumeration. To resolve this, a mandatory ProgramName was added to the table and its key.
Changed rolename in the relationship between Course and CourseOffering to split EducationOrganizationId from SchoolId [Issue 41]	The Session table should include SchoolId instead of EducationOrganizationId. The Session table includes an EducationOrganizationId in the primary key, but this always resolves to a school. To make this explicit, the column has been renamed to SchoolId. As a consequence, the Section table−to which the primary key of Session migrates−has been impacted by this change.

Change	Rationale
Added values to ProgramType for Early Learning support: • Early Head Start • Early Intervention Services Part C • Fee For Service • Home Visiting • Preschool Special Education • Public Preschool • Kindergarten – Full Day • Kindergarten – Half Day • Kindergarten – Extended Day [Issue 62]	Added values identified as missing
Increased cardinality for IdentificationCode on LearningStandard and added ContentStandard [Issue 124]	A LearningStandard may have multiple IdentificationCodes, as the same standard can be a part of a national, state and local standard simultaneously−each with its own identification system.

Appendix B: Details of Updates to the Ed-Fi Tool Suite

This section documents the full set of enhancements and fixes made to the Ed-Fi tool suite since Ed-Fi v1.1. A comprehensive log of changes is also available to licensees in the Ed-Fi v1.1.1.1 and Ed-Fi v1.2 change logs.[8]

Changes With Backward Compatibility Considerations

v1.1.1.1 Release

- Eliminated the need for extension paging providers[9] (*Contributed by Arkansas Department of Education*)
- Changed data serialization framework to ServiceStack TypeSerializer[10] (*Contributed by the Texas Education Agency*)

v1.2 Release

- Changed Teacher List and Staff List to pull the metadata from a provider[11] (*Contributed by the Texas Education Agency*)

Access to change log links are only available to Ed-Fi solution licensees who have requested access to the Ed-Fi Alliance repository on GitHub.

[8] https://github.com/Ed-Fi-Alliance/Ed-Fi-Release/wiki/Ed-Fi-v1.1.1.1-Changelog and https://github.com/Ed-Fi-Alliance/Ed-Fi-Release/wiki/Ed-Fi-v1.2-Changelog

[9] https://github.com/Ed-Fi-Alliance/Ed-Fi-Release/wiki/Pull-Request-114-Detail-eliminate-need-for-extension-paging-providers

[10] https://github.com/Ed-Fi-Alliance/Ed-Fi-Release/wiki/Pull-Request-115-Detail-change-data-serialization-framework-servicestack-typeserializer

[11] https://github.com/Ed-Fi-Alliance/Ed-Fi-Release/wiki/Change-Teacher-and-Staff-to-pull-the%20metadata-from-a-provider

Dashboard Enhancements

v1.1.1.1 Release

- Added extensibility mechanism around defining MVC routes−area registration of routes can now be customized by creating a component that implements the new IAreaRouteMappingPreparer interface (*Contributed by the Ed-Fi Alliance*)
- Changed fields in Page object to virtual properties so they can be overridden by extensions (*Contributed by the Arkansas Department of Education*)
- Moved definition of "mastered objective" on an assessment to its own method, so that it can be overridden by extensions. Previously, "mastered objective" was defined as good, verygood or acceptable metric states in a way that could not easily be overridden (*Contributed by the Arkansas Department of Education*)
- Improved extensibility of StudentDemographicListController by making Get(...) and FixDemographicNomenclature(...) methods virtual (*Contributed by the Arkansas Department of Education*)
- Removed default, generated code from OnServiceConfigurationCreated() event handler in Global.asax (*Contributed by the Arkansas Department of Education*)
- Fixed Historical Assessment chart to work in IE8 (*Contributed by the Ed-Fi Alliance*)
- General performance enhancements resulting from code profiling tool reports (*Contributed by the Texas Education Agency*)
- Added the ability to export district-level student lists (*Contributed by the Texas Education Agency*)
- Refactored MetricThreshold screen to use a view model, thus making it more extensible (*Contributed by the Arkansas Department of Education*)
- Added better error message to NoTemplate.cshtml to explain the condition when DomainEntityType is not set (*Contributed by the Arkansas Department of Education*)
- Moved two methods out of the static utilities class and into the GradeLevelUtilitiesProvider class so that they can be extended if needed (*Contributed by Little Rock ISD*)
- Modified Student security filtering to use dynamically compiled Linq expressions instead of .NET reflection, resulting in performance improvements (*Contributed by the Texas Education Agency*)

v1.2 Release

- Added self-service web interface for photo upload (*Contributed by the Arkansas Department of Education*)
- Added ADA-compliant accessibility support (*Contributed by the Texas Education Agency*)
- Refactored the learning standards controller to remove hard-coded strings (e.g., TEKS) (*Contributed by the Arkansas Department of Education*)
- Refactored the CreditAccumulationChart so that the text is customizable (*Contributed by Little Rock ISD*)
- Removed DOB and years of experience from the staff list (*Contributed by the Ed-Fi Alliance*)
- Added new standards for extensions (*Contributed by the Ed-Fi Alliance team*)

ETL Enhancements

v1.1.1.1 Release

- Added support for a hash table of custom variables to be passed to the EtlUnit test framework (*Contributed by the Arkansas Department of Education*)
- Add support for names of demographics that include parentheses (*Contributed by the Arkansas Department of Education*)
- Modified the AssessmentItem package and added test data to handle "-" and "_" characters (*Contributed by the Ed-Fi Alliance*)
- Changed StudentRecord package to retrieve GradeLevel description rather than GradeLevelTypeId for Advanced Placement exam history (*Contributed by the Arkansas Department of Education*)
- Altered max attendance calculation to support filtering by school rather than by district (*Contributed by the Texas Education Agency*)
- Implemented performance enhancements to the Course Grade query in StudentCourseGradeMetrics.dtsx package (*Contributed by the Texas Education Agency*)

v1.2 Release

- Implemented roll-up of school-level learning standard mastery data to the district level; the dashboard page had the capability to display this, but this was

not implemented in the ETL at the district level (*Contributed by the Delaware Department of Education*)

- Enhanced unexcused and excused absent metrics to compare to threshold goals that are dynamically pulled from metric.metricstate rather than hard coded in the package (*Contributed by the Texas Education Agency*)
- Improved calculation of the "refresh date" (last updated date) for ACT® and SAT® assessment results data (*Contributed by the Texas Education Agency*)
- Implemented the functionality of interchanging the method of encoding the metric instance set key to make it easier to extend the hashing mechanism, if needed (e.g., if using a different ETL tool) (*Contributed by the Texas Education Agency*)
- Added Ed-Fi Exception handling to the dashboard and data warehouse ETL packages (*Contributed by the Texas Education Agency*)
- Dynamically read threshold values for days absent and unexcused days absent for school attendance (*Contributed by the Texas Education Agency*)
- Dynamically use the threshold goal for student excused unexcused days absent (*Contributed by the Texas Education Agency*)
- Modified the structure of the underlying tables that support the learning standards drill down (*Contributed by the Delaware Department of Education*)
- Implemented support for multiple LEAs in data warehouse packages (*Contributed by the Delaware Department of Education*)
- Changed the connections for the Import Dashboard Types package to use csv files for metric data import. For more information see *Import Dashboard Types* information on GitHub[12]. (*Contributed by the Texas Education Agency*)

Infrastructure Enhancements

v1.1.1.1 Release

- Enabled generation of TeamCity build reports even when SQL Server does not have access to the file system by moving the file access commands from SQL Server to Powershell scripts (*Contributed by the Ed-Fi Alliance*)
- Added a PowerShell script for installing SSIS pipeline components (*Contributed by the Ed-Fi Alliance*)

---

[12] https://github.com/Ed-Fi-Alliance/Ed-Fi-Release/wiki/Import-Dashboard-Types

v1.2 Release

- Added page compression to each of the Ed-Fi ODS, Dashboard and Dashboard DW tables to improve performance during builds and for dashboard queries; for more information see the TechNet documentation[13] (*Contributed by the Texas Education Agency*)

Dashboard Defects Resolved

v1.1.1.1 Release

- The "Format" parameter defining the display format for the metric is not truly required for the code in StudentMetricAssessmentHistoricalService, yet the code would throw an exception when it was not specified−removed the requirement to specify Format (*Contributed by the Arkansas Department of Education*)
- Added code to strip out password information in the message sent to the log file when an error occurs in the password field (*Contributed by the Texas Education Agency*)
- Fixed a bug in the rolling up of student indicators to the LEA level−the ETL was doing a merge join, which requires the data to first be sorted, but the data was not sorted (*Contributed by the Arkansas Department of Education*)

v1.2 Release

- Added a check for the existence of a folder in the core code base instead of letting the application throw an error (*Contributed by the Delaware Department of Education*)
- Fixed a caching issue with claims that allows state-level users to login to a district (*Contributed by the Delaware Department of Education*)

---

[13] http://technet.microsoft.com/en-us/library/cc280449.aspx

ETL Defects Resolved

v1.1.1.1 Release

- Added missing join to CourseOffering table, which should have been added when CourseOffering was added in v1.1−without these joins, the user cannot take advantage of the added "course offering" concept and instead can only use courses and sections, as they did in v1.0 (*Contributed by the Arkansas Department of Education*)

v1.2 Release

- Fixed a bug in handling multiple district discipline data where data was not sorted prior to merge join−this only manifests itself in the use case where an ODS is storing data from multiple districts (*Contributed by the Arkansas Department of Education*)
- Fixed a data type conversion error from (Result) to (Copy of Result) in Student Assessment (*Contributed by the Texas Education Agency*)
- Trimmed the CourseTitle in StudentCourseGradeMetrics to avoid automatic truncation, which was violating a primary key (*Contributed by the Delaware Department of Education*)