



# Ed-Fi Extension and Semantic Analysis: Delaware

## Purpose and Brief of the Analysis

The purpose of this report is to work with the Delaware Department of Education (DDOE) as the partner of Ed-Fi Alliance (Ed-Fi) and share Ed-Fi's findings for the assessment of extensions and semantic alignment of the state's usage of data elements in Ed-Fi's core data standard.

Our analysis has concluded that Delaware is well-aligned with Ed-Fi core semantically for data elements they are using from the Ed-Fi UDM (Unified Data Model), which means the data elements in the Ed-Fi core are almost always used by the State as intended.

Delaware has used the extension mechanism quite often. Our analysis has shown that about 40 percent of data elements Delaware had in their Ed-Fi model was created by the state to extend the Ed-Fi UDM where the core data standard did not meet specific needs of the state in areas that include student enrollment data, course offering and grades, teaching and learning, student transportation, special education and other IDEA mandated programs, restraint and seclusion relating student and staff, discipline, CTE instruction, and student medical records.

As found in the section below, the extension analysis looked at areas where there are current options available in the core; where there might be better alternatives for extension; and where extensions should be considered by Ed-Fi for inclusion into the core data model.

## Body of the State Analysis

The Ed-Fi Alliance is committed to sustaining the Ed-Fi data standard to support the capture, usage, reporting, and exchange of educational data. As such the Ed-Fi data standard promotes data interoperability in the industry, enables data-driven decision making, and hence contributing to the advancement of educational outcomes.

In a continuing effort to better serve the community of users, this analysis is the first of a periodic evaluation of how the various Ed-Fi states are using and extending the Ed-Fi data model. In particular, the analysis is meant to investigate the following questions:

- Is the State using the core Ed-Fi data model as semantically defined and intended?
- Does the State follow good practices in extending the Ed-Fi data model, adhering to the overall conventions embodied in the data standard?



- Do extensions duplicate what could be reflected in the Ed-Fi core model, or are there subsequent updates to the core that now cover what previously required an extension?
- Are there extensions that point to common needs across states and/or potential model changes that would benefit the community at large?

The analysis findings specific to Delaware are summarized in the following sections: *extension analysis* has a focus on the extensions the state introduced, and the *semantic analysis* evaluates the usage of the core data standard by the state and any deviations from the original purpose of the data elements. The intent of this analysis is to improve the Ed-Fi data standard and its usage in the community. The analysis should be taken as an *opinion* based upon published materials by Ed-Fi and the states to stimulate further collaboration.

## Extension Analysis

The Delaware extensions comprise one new entity, two new associations, and 49 attributes as outlined below.

- Attribute extensions to StudentEducationOrganizationAssociation are as follows:
  - StudentEducationOrganizationAssociations.Addresses.Complex
  - StudentEducationOrganizationAssociations.Addresses.Development
  - StudentEducationOrganizationAssociations.ChoicecategoryDescriptor
  - StudentEducationOrganizationAssociations.FerpaoptoutDescriptor
  - StudentEducationOrganizationAssociations.FerpaAddress
  - StudentEducationOrganizationAssociations.FerpaName
  - StudentEducationOrganizationAssociations.Ferpaphone
  - StudentEducationOrganizationAssociations.Ferpaphoto
  - StudentEducationOrganizationAssociations.Multiliteracies.certificatecategoryDescriptor
  - StudentEducationOrganizationAssociations.Multiliteracies.languageDescriptor
  - StudentEducationOrganizationAssociations.Multiliteracies.assessmenttitle
  - StudentEducationOrganizationAssociations.Multiliteracies.certificateissueconfirm
  - StudentEducationOrganizationAssociations.Scholarshipamount
  - StudentEducationOrganizationAssociations.ScholarshipName
- Attribute extensions to StudentEducationOrganizationResponsibilityAssociation are as follows:
  - StudentEducationOrganizationResponsibilityAssociation.Transfer.BeginDate
  - StudentEducationOrganizationResponsibilityAssociation.Transfer.EducationOrganizationId
  - StudentEducationOrganizationResponsibilityAssociation.Transfer.ExternalEducationOrganizationName



- StudentEducationOrganizationResponsibilityAssociation.Transfer.GradeLevelDescriptor
- StudentEducationOrganizationResponsibilityAssociation.Transfer.ResponsibilityDescriptor
- StudentEducationOrganizationResponsibilityAssociation.Transfer.StudentUSI
- Attribute extensions to the StudentSchoolAssociation are as follows:
  - StudentSchoolAssociations.EnrollmentTypeDescriptor
  - StudentSchoolAssociations.ChoiceBasisDescriptor
  - StudentSchoolAssociations.NextYearschoolId
  - StudentSchoolAssociations.NextYearGradeLevelDescriptor
- Attribute extensions to the Section are as follow:
  - Sections.Description
  - Sections.CourseLevelDetailReference.LevelNumber
  - Sections.CourseLevelDetailReference.SchoolId
  - Sections.MarkingPeriods.GradingPeriodDescriptor
  - Sections.MarkingPeriods.UsedSeat
  - Sections.SubjectAreas.AcademicSubjectDescriptor
  - Sections.SubjectAreas.SubjectAreaLastModifiedDate
  - Sections.SubjectAreas.Subjectorder
- Attribute extensions to the CalendarDate are:
  - CalendarDates.CycleDescriptor
  - CalendarDates.MembershipDayValue
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.ProgramName
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.ProgramTypeDescriptor
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.SchoolId
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.SchoolYear
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.EducationOrganizationId
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.Learningmodalities.ModalityTime
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.ModalityTypeDescriptor
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.ModalitytimeTypeDescriptor
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.CalendarCode
  - CalendarDates.EdFiXLearningModality.ProgramLearningModalityTypes.Date



- Attribute extensions to the Course entity is as follows:
  - Courses.ApExamCodeDescriptor
  - Courses.CoreSubjectDescriptor
  - Courses.StaffCredentialFieldDescriptor
  - Courses.SecondaryStaffCredentialFieldDescriptor
  - Courses.SecondaryStaffClassroomServiceStatusDescriptor
  - Courses.SecondaryStaffRoleDescriptor
  - Courses.Active
  - Courses.AveragePassTimeMinutesPerWeek
  - Courses.FractionOfYearOffered
  - Courses.LevelNumber
  - Courses.MinutesPerWeekAverage
  - Courses.UnitCountExceptionSchoolReference.SchoolId
- Attribute extensions to the GradingPeriod entity are:
  - Gradingperiods.Startweek
  - Gradingperiods.Endweek
- Attribute extensions to the Parent entity (*renamed in DS v5.0 as Contact*) are followings:
  - Parents.Addresses.Complex
  - Parents.Addresses.Development
- Attribute extensions to the StudentParentAssociation (*renamed in DS v5.0 as StudentContactAssociation*) are as follow:
  - Studentparentassociations.ContactTypeDescriptor
  - Studentparentassociations.Localeducationagencyid
- Attribute extensions to the StudentLanguageInstructionAssociation are:
  - StudentLanguageInstructionProgramAssociation.Languageimmersion.ImmersionLanguage
  - StudentLanguageInstructionProgramAssociation.Languageimmersion.GradeLevel
  - StudentLanguageInstructionProgramAssociation.Languageimmersion.Comment
  - StudentLanguageInstructionProgramAssociation.Languageimmersion.SchoolYear
- Attribute extensions to the StudentSpecialEducationProgramAssociation are following:
  - StudentSpecialEducationProgramAssociation.Diplomacertificatecategorydescriptor
  - StudentSpecialEducationProgramAssociation.Fundingneedscategorydescriptor
  - StudentSpecialEducationProgramAssociation.Servicestatusdescriptor
  - StudentSpecialEducationProgramAssociation.Dstpaccommodation
  - StudentSpecialEducationProgramAssociation.Eligiblenotreceivingservice
  - StudentSpecialEducationProgramAssociation.Evaluatednodisability



- StudentSpecialEducationProgramAssociation.Initialconsenttoevaluatedate
- StudentSpecialEducationProgramAssociation.Initialevaluationdate
- StudentSpecialEducationProgramAssociation.Lastspecialistevaluationdate
- StudentSpecialEducationProgramAssociation.Percentoutofregularclass
- StudentSpecialEducationProgramAssociation.PPPSISPInitiationDate
- StudentSpecialEducationProgramAssociation.Pppsmeetingdate
- StudentSpecialEducationProgramAssociation.Specialeducationfundingcountexception
- StudentSpecialEducationProgramAssociation.Privateschoolreference.schoolid
- Attribute extensions to the StudentCTEProgramAssociation are as follow:
  - StudentCTEProgramAssociation.CTEProgram.Certification
  - StudentCTEProgramAssociation.CTEProgram.PathwayConcentrator
  - StudentCTEProgramAssociation.CTEProgram.LocalArticulation
- New entity StudentTransportation with attributes:
  - StudentTransportation.TravelDayOfWeekDescriptor
  - StudentTransportation.TravelDirectionDescriptor
  - StudentTransportation.TravelSegment
  - StudentTransportation.TravelTrip
  - StudentTransportation.LocalEducationAgencyId
  - StudentTransportation.StudentUniqueid
  - StudentTransportation.BusNumber
  - StudentTransportation.BusRouteNumber
  - StudentTransportation.ShuttleStop
  - StudentTransportation.StopDescription
  - StudentTransportation.StopNumber
  - StudentTransportation.StopTime
- New entity GradeTypeDetail with attributes:
  - GradeTypeDetail.gradeTypeDescriptor
  - GradeTypeDetail.schoolid
  - GradeTypeDetail.gradeTypeOrder
  - GradeTypeDetail.gradeTypeWhenTakenDescriptor
- New entity LevelDetail with attributes:
  - LevelDetail.levelNumber
  - LevelDetail.mark
  - LevelDetail.schoolid
  - LevelDetail.levelDescription
  - LevelDetail.passingMark



- LevelDetail.pointValue
- LevelDetail.reportCardPrintValue
- LevelDetail.transcriptPrintValue
- New entity PostSecondaryDetail with attributes:
  - PostSecondaryDetail.PostSecondaryEventCategoryDescriptor
  - PostSecondaryDetail.schoolId
  - PostSecondaryDetail.schoolYear
  - PostSecondaryDetail.studentUniqueId
  - PostSecondaryDetail.PostSecondaryInstitutionId
  - PostSecondaryDetail.reasonNotApplied4PlusCollegeDescriptor
- New entity StudentAssessmentRegistration with attributes:
  - StudentAssessmentRegistration.assessmentAdministrationReference.AdministrationIdentifier
  - StudentAssessmentRegistration.assessmentAdministrationReference.Assigningeducationorganizationid
  - StudentAssessmentRegistration.assessmentAdministrationReference.Namespace
  - StudentAssessmentRegistration.studentEducationOrganizationAssociationReference.Educationorganizationid
  - StudentAssessmentRegistration.studentEducationOrganizationAssociationReference.Studentuniqueid
  - StudentAssessmentRegistration.testingEducationOrganizationReference.Educationorganizationid
- New entity RestraintSeclusion with attributes:
  - RestraintSeclusion.eventDate
  - RestraintSeclusion.eventTime
  - RestraintSeclusion.restraintEventCategoryDescriptor
  - RestraintSeclusion.restraintEventReasonDescriptor
  - RestraintSeclusion.staffProvidingRestraint.Staffordinal
  - RestraintSeclusion.staffProvidingRestraint.Trainedactiontechnique
  - RestraintSeclusion.schoolId
  - RestraintSeclusion.studentUniqueId
  - RestraintSeclusion.additionalDetail
  - RestraintSeclusion.behaviorDuringRestraintDetail
  - RestraintSeclusion.changeDescription
  - RestraintSeclusion.consecutiveRestraintCount
  - RestraintSeclusion.deescalationTechniqueDescriptor



- RestraintSeclusion.incidentLocationDescriptor
- RestraintSeclusion.nonViolentTechniqueDescriptor
- RestraintSeclusion.notificationMethodDescriptor
- RestraintSeclusion.parentGuardianNotified
- RestraintSeclusion.parentGuardianNotifiedDate
- RestraintSeclusion.parentGuardianNotifiedTime
- RestraintSeclusion.policyChangeDetail
- RestraintSeclusion.priorToEventDetail
- RestraintSeclusion.restraintDuration
- RestraintSeclusion.restraintReportDate
- RestraintSeclusion.staffInjured
- RestraintSeclusion.staffTrainingDetail
- RestraintSeclusion.staffTreatmentDescriptor
- RestraintSeclusion.studentInjured
- RestraintSeclusion.studentInterviewDetail
- RestraintSeclusion.studentTreatmentDescriptor
- RestraintSeclusion.supportPlanChangeDescriptor
- RestraintSeclusion.usedCrisisResponseTeam
- RestraintSeclusion.witnessInterviewDetail
- New entity AllegedBullyingVictim with attributes:
  - AllegedBullyingVictim.allegedIncidentDate
  - AllegedBullyingVictim.schoolId
  - AllegedBullyingVictim.studentUniqueId
  - AllegedBullyingVictim.bullyingCategory.Bullyingcategorydescriptor
  - AllegedBullyingVictim.followupComment
  - AllegedBullyingVictim.incidentDescription
  - AllegedBullyingVictim.incidentLocationDescriptor
  - AllegedBullyingVictim.multiplePriorEvent
  - AllegedBullyingVictim.reasonIncidentRelatedToDescriptor
  - AllegedBullyingVictim.reportDate
  - AllegedBullyingVictim.reportedBy
- New entity MedicalAlert with attributes:
  - MedicalAlert.medicalAlertCategoryDescriptor
  - MedicalAlert.sensitive
- New entity PersonMedicalAlert with attributes:
  - PersonMedicalAlert.sequence



- PersonMedicalAlert.startDate
- PersonMedicalAlert.medicalAlertCategoryDescriptor
- PersonMedicalAlert.personReference.SourceSystemDescriptor
- PersonMedicalAlert.personReference.PersonId
- PersonMedicalAlert.endDate
- New entity MedicationBox with attributes:
  - MedicationBox.medicationBoxId
  - MedicationBox.localEducationAgencyId
  - MedicationBox.medicationCode
  - MedicationBox.medicationDescription
- New entity MedicalScreening with attributes:
  - MedicalScreening.medicalTestCategoryDescriptor
  - MedicalScreening.testDate
  - MedicalScreening.personReference.SourceSystemDescriptor
  - MedicalScreening.personReference.PersonId
  - MedicalScreening.schoolOfServiceSchoolReference.SchoolId
  - MedicalScreening.athleticStatus
  - MedicalScreening.screeningEducationOrganizationId
  - MedicalScreening.screeningLocationDescriptor
- New entity PersonImmunization with attributes:
  - PersonImmunization.immunizationCodeDescriptor
  - PersonImmunization.immunizationDate
  - PersonImmunization.personReference.SourceSystemDescriptor
  - PersonImmunization.personReference.PersonId
  - PersonImmunization.immunizationExemptReasonDescriptor
- New entity MedicalOfficeVisit with attributes:
  - MedicalOfficeVisit.officeInDate
  - MedicalOfficeVisit.personReference.SourceSystemDescriptor
  - MedicalOfficeVisit.personReference.PersonId
  - MedicalOfficeVisit.schoolOfServiceSchoolReference.SchoolId
  - MedicalOfficeVisit.contactTypeDescriptor
  - MedicalOfficeVisit.medicalDisposition.medicalDispositionDescriptor
  - MedicalOfficeVisit.medicalTreatmentCode.medicalTreatmentCodeDescriptor
  - MedicalOfficeVisit.medicalVisitReason.medicalVisitReasonDescriptor
  - MedicalOfficeVisit.officeOutDate
- New entity MedicalReferralFollowUp with attributes:





- MedicalReferralFollowUp.followupCategoryDescriptor
- MedicalReferralFollowUp.medicalTestCategoryDescriptor
- MedicalReferralFollowUp.testDate
- MedicalReferralFollowUp.personReference.Sourcesystemdescriptor
- MedicalReferralFollowUp.personReference.PersonId
- New association Student504ProgramAssociation with attributes:
  - Student504ProgramAssociation.BeginDate
  - Student504ProgramAssociation.EducationOrganizationId
  - Student504ProgramAssociation.ProgramReference.Educationorganizationid
  - Student504ProgramAssociation.ProgramReference.Programname
  - Student504ProgramAssociation.ProgramReference.Programtypedescriptor
  - Student504ProgramAssociation.StudentUniqueld
  - Student504ProgramAssociation.AccommodationPlan
  - Student504ProgramAssociation.DisabilityDescriptor
  - Student504ProgramAssociation.InititalDNQDate
  - Student504ProgramAssociation.LastEvaluationDate
  - Student504ProgramAssociation.MeetingDate
- New association StudentEarlyChildhoodProgramAssociation with attributes:
  - studentEarlyChildhoodProgramAssociation.beginDate
  - studentEarlyChildhoodProgramAssociation.educationOrganizationId
  - studentEarlyChildhoodProgramAssociation.programReference.Educationorganizationid
  - studentEarlyChildhoodProgramAssociation.programReference.Programname
  - studentEarlyChildhoodProgramAssociation.programReference.Programtypedescriptor
  - studentEarlyChildhoodProgramAssociation.studentUniqueld
  - studentEarlyChildhoodProgramAssociation.reasonExitedDescriptor.Programtypedescript  
or
  - studentEarlyChildhoodProgramAssociation.regulation619DeterminedEligible
  - studentEarlyChildhoodProgramAssociation.regulation619PartCReferralDate
  - studentEarlyChildhoodProgramAssociation.districtNotificationDate
  - studentEarlyChildhoodProgramAssociation.iepMeetingDate
  - studentEarlyChildhoodProgramAssociation.iepImplementationDate
  - studentEarlyChildhoodProgramAssociation.reasonForLateIEPDescriptor
- New association PersonMedicationBoxAssociation with attributes:
  - PersonMedicationBoxAssociation.localEducationAgencyId
  - PersonMedicationBoxAssociation.medicationBoxId
  - PersonMedicationBoxAssociation.personReference.Sourcesystemdescriptor



- PersonMedicationBoxAssociation.personReference.PersonId
- PersonMedicationBoxAssociation.issue.Issuedate
- PersonMedicationBoxAssociation.medicationRequired

## Semantic Analysis

Delaware is well-aligned with the Ed-Fi data standard with all of 367 data elements aligned semantically with the Ed-Fi core.

## Summary of Findings

The analysis found that Delaware created a significant number of extensions to the Ed-Fi core either through extending the current entities and associations or adding new of them. In total there were 231 data element (attributes) extension observed in various areas including student enrollment, course offering and grades, language instruction, CTE program, early childhood program, transportation, and medical related. 95 of these model extensions are nested in existing entities and attributes (47 in associations, 48 in entities) where 136 attributes added to the model via a new association or an entity (30 in associations, 106 in entities). Delaware has the largest extension in medical related fields among all states we have collected data for. About 20% of all extension Delaware had on medical related data tracking. Enrollment and programs are the other two areas the state had the most extension for. Extensions relating to these two areas are about 40% of all extensions we have observed in Delaware.

Since the data collection for this analysis was made early 2024, by the time this report has been created Ed-Fi UDM has included some of the extensions we have observed in Delaware. These updates are in the assessment registration, student transportation, Section 504 and student immunization. Attributes in these entities and associations account for about 15% of extensions.