



# Marked Present: Recommendations for Building a Framework to Measure Attendance Data Across Learning Models

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# Problem

School districts operating under the COVID-19 pandemic have adapted quickly to gather new kinds of data related to how each student is participating in instruction. The data on if and when individual students were “remote” or “on campus” or in some other instructional “modality”, and what we can capture about their activity in that modality, is not just critical operational data today, but will be important data as districts and state education agencies consider outcomes, efficacy and equity of instruction in the future. Likewise, we have seen some shifts in attendance processes, and greater interest in data related to online instructional engagement.

To understand this data – where it is, how it is being captured, what stakeholders are asking for as it is exchanged, and generally how this data can be used at scale in K12 education – the Ed-Fi Alliance launched a research project. The goal was to understand:

-  **If there was new data, and if so what that data looked like.**
-  **How new data elements should be represented in Ed-Fi’s standards and technology.**
-  **What ecosystem challenges there are to usage of this standardized data at scale in K12.**

Ultimately, the Ed-Fi Alliance aims to ensure districts and state education agencies have access to and can make use of this new data.

**Given the pace districts and SEAs have had to adapt, there is a high risk that the data is not collected or accessible in a standard way and that ad-hoc collection processes will lead to poor data quality and data that is unreliable to inform decision making.**

Our goal with this document is twofold:

- 1** To provide guidance on how this new data can be captured in the Ed-Fi data standard
- 2** To make a call to action to districts, SEAs, and SIS vendors to collaborate and align the data structures and processes that are needed to make this data reliable and useful.



## What We Did

This analysis was generated via synchronous interviews with state education agencies (6 interviews), local education agencies (16 interviews), and student information system (SIS) providers (7 interviews).

The interviews drew primarily but not exclusively from organizations actively using Ed-Fi standards and technology. SIS interviews focused primarily on multi-state SIS systems known to have large market share.

To the extent possible, the Alliance sought to understand the actual implementation details for stakeholder systems at a data model and operational process level. This detailed understanding was achieved in most cases but not universally.



## What We Learned

The context that generates and defines this new data has been and will remain fluid: school district operations are evolving and changing, and guidance from states on what data they are collecting continues to shift. Nevertheless, our research suggests that there are enough “knowns” – particularly that LEA and SEA operations are sufficiently defined – both to understand key challenges of using this new data at scale and to assert a normative model for the Ed-Fi community on how key data points should be represented for data exchange.

### FINDING #1: THREE NEW CATEGORIES OF DATA.

In asking the question of “what had changed” and following those changes back to data systems, we discerned three new types of data:

#### 1 Student Instructional Modality

Generally, modality was captured on a daily basis: a student is “remote” or “virtual” some days and “in person” on others. But if applied to other entities that were more complex – such as a class or section – values like “hybrid” might apply: a “hybrid” student’s schedule might be a mixture of “in person” and “virtual” activity.

## 2 Method of Attendance Verification

This is data on how student daily or section attendance was verified, and would typically be captured as an attendance code, as in “Present – Completed Assignment” or “Present – Synchronous Class Participation”

## 3 Student Engagement in Instruction

This data could vary widely: it could consist of “telemetry” elements, such as daily logins into an online system, or process elements, such as if coursework was completed.

Management and collection of this data broke down across stakeholders as follows.

Data Element(s)	Example(s)	Captured By		Supported by SIS provider?
		LEAs	SEAs	
<b>Student Instructional Modality</b>	“student A is in “virtual” instruction for the grading period”	Yes	Mostly	Supported
<b>Method of Attendance Verification</b>	“student A attendance in virtual section X was verified by assignment”	Rarely	No	Some support <sup>1</sup>
<b>Student Engagement in Instruction</b>	“student A logged into system X on Monday” “student A completed assignment X on Tuesday”	Rarely <sup>2</sup>	No	No direct support

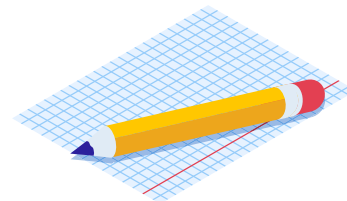
1. On support for the method of attendance verification by SIS providers: all SIS systems provided some means to capture this data. But doing so would require a district to transition to a “positive” attendance model (students assumed absent, then marked present), and some SIS systems were clearly not optimized for positive attendance processes. So while it was universally possible to do this, it was not a “mainstream” function in some cases.

2. See Finding #6 below.

## FINDING #2: SIS SYSTEMS HAVE NEARLY UNIVERSALLY DEVELOPED A NEW FEATURE FOR CAPTURE OF STUDENT INSTRUCTIONAL MODALITY DATA.

SIS providers have designed this new feature in different ways but most share the central design feature of “tagging” a student to a modality with a set of date ranges.

However, where this element is attached and where one finds the screens to support it varies: in some systems, this new element is attached to a student and in others to a student enrollment. In some it is designed similar to a “program” participation model, and in others it is a more independent feature.



### **FINDING #3: FOR CAPTURE AND MANAGEMENT OF STUDENT INSTRUCTIONAL MODALITY, THERE IS GENERAL ALIGNMENT IN SIS SYSTEMS FEATURES, SEA DATA REQUIREMENTS AND LEA PRACTICES.**

The three classes of stakeholder groups have built features and data structures that are similar in purpose and design. In general, they have built structures that tie a student modality to a date range. As a student switches modality, new records are written, and old ones closed off (via an end date).

In a few cases, capture of modality was less complex and or non-relevant: all students were still remote, or parental choice was for the entire semester, so a simpler “flag” on student was sufficient to capture the data at the time.

Overall, this is good news for standardization, as it indicates alignment in use cases, concerns, and data structures.

### **FINDING #4: DISTRICT METHODS AND PROCESSES FOR CAPTURING STUDENT INSTRUCTIONAL MODALITY DATA ARE HIGHLY IDIOSYNCRATIC AND LOCAL, AND DO NOT TYPICALLY USE THE SIS PROVIDED FEATURE.**

In fact, we spoke to no LEAs who were using the canonical SIS feature (see Finding #2). Instead, LEAs had generally designed localized patterns and processes to capture modality data.

Many were not aware of the new SIS support, but those who were cited time constraints or reasons that tied back to time constraints (e.g. could not update the SIS to the new version; insufficient time for retraining staff; etc.) as the reasons for not using the feature.

So while Finding #3 is good news for standardization, the highly localized LEA data management practices are a large practical issue in establishing access to and reporting on the modality data at scale.

**We should note, however, that there may be more common patterns than we perceived:**



Given our interviewee sample size, it was unclear the extent to which LEAs using the same SIS might be using common features. We ran into a case where this was happening, but given the small sample size it was not clear that there was more general coordination.



The impact of SIS “state editions” was also unclear. These editions could be exerting an effect over how LEAs are operating – i.e. LEAs in the same state using the SIS in the same way.

### **FINDING #5: LITTLE HAS CHANGED WITH ATTENDANCE PROCESSES AND DATA BEYOND ADDING NEW ABSENCE CODES AND A SLIGHT UPTICK IN POSITIVE ATTENDANCE USAGE.**

In the large majority of cases, neither SIS systems, SEAs or LEAs were collecting and managing attendance differently beyond having evolved or expanded their absence codes in response to COVID.

We did find a few instances of agencies (1 SEA and 1 LEA) switching to “positive” attendance models, mostly to support a combination of capturing attendance verification method by a teacher (e.g. “Present – Completed Assignment” as opposed to just “Present”) and data quality reasons (i.e. the fear that attendance processes would not be accurate for remote learners unless teachers were required to state verification methods).

**FINDING #6: LEAS ARE UNIVERSALLY INTERESTED IN LEVERAGING DATA ON STUDENT ONLINE ENGAGEMENT AT SCALE, BUT GENERALLY ONLY WELL-RESOURCED LEAS ARE DOING SO AT THIS TIME. SEAS AND SIS SYSTEMS ARE GENERALLY NOT PLAYING A ROLE.**

Universally LEAs saw potential in aggregating and using student online engagement data at scale in their central operations. We heard various kinds referenced: this might be “telemetry” style data, such as logins to online systems or usage durations for online activity, and in other cases it was workflow or process data, such as student assignment completions.

In very few cases, however, did the district have any regular and efficient process for assembling this data, and in almost no cases did we learn about a district actually making use of this data in a centralized fashion. (Note that the Alliance has in its regular operations seen examples of school districts assembling and making use of this data centrally, in repeatable and efficient process).

Interviewees believed that teachers were consulting this kind of data through the product interfaces and features that were targeted at classroom-level usage.



# What the Alliance Recommends

## **Recommendation #1: States Lead the Way**

State departments of education should work together to coordinate their data specifications in these areas, particularly around capture of modality.

States recently achieved similar coordination with the Digital Equity Collection effort led by Wisconsin Department of Public Instruction, which defined Ed-Fi specifications for transmission of key metrics related to technology access from the home.

As noted above, there is general alignment across SEAs and LEAs to build on. Minimizing state-specific data collection standards will alleviate the burdens on SIS systems who are operating across state boundaries and provide incentive for districts to standardize their data collection processes.

For Ed-Fi states, we provide specific guidance in section 2 of this document.

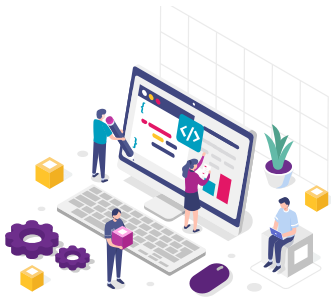
## **Recommendation #2: Build a Team with the SIS at the Center**

States should work with “cohorts” of LEAs who are using the same SIS, with the SIS vendor participating, to determine to best ways to get access to these data elements at scale.

As noted above, the key problem is that LEAs are managing this data in highly idiosyncratic ways. That will place a great burden on the SIS as it tries to assist districts with state reporting. Accommodating all these idiosyncratic approaches to capturing data in the SIS will likely lead to substantial data quality problems. It also means that standardized data out pipelines, like the Ed-Fi data standard and APIs, will not serve LEA data needs.

For example, such a cohort may determine that the best option is to migrate data and processes to the SIS canonical feature, or determine that modeling the data as a program is the best option.





## Call to Action

The Ed-Fi Alliance is committed to organizing and facilitating a Study Group to dig deeper into solving this known issue. This will be a forum to gather the collective wisdom of the K12 community to better inform education leaders across states, districts, and vendors on how to fully utilize data to support students and teachers. The Study Group will allow us to come together to both deepen understanding of this information and ultimately to take action on the recommendations.

We invite any SEA, LEA, or SIS vendor representative who is willing to dive into the details of student instructional modality, attendance, and engagement to join the Study Group. This group will be focused on action. We will bridge the gap between policy and data system implementation, tackling the challenges of creating more consistency in student instructional modality data.



To join this Study Group please email [governance@ed-fi.org](mailto:governance@ed-fi.org)





# Ed-Fi Data Model and Data Specifications

## Terminology

- “student instructional modality” (sometimes shortened to “modality”): the mode by which a student is receiving instruction or attending class for a given time period, e.g. “virtual”, “on campus”, etc.
- “negative attendance”: the practice of marking student attendance by only marking when a student is absent
- “positive attendance”: the practice of marking student attendance by only marking when a student is present
- “positive + negative attendance”: the practice of marking all student attendance events, whether positive or negative

## Use Cases

Data is defined by its use case. In the present context to list all the specific stakeholders and use cases would take considerable space. Instead, below is a short summary of two new key data points we found repeated in our research and examples of why each was cited as important.

New data element	Use cases cited (sample only)
<p>The student instructional modality, which distinguishes “remote” and typically “online” from “on-campus” and typically “in-person” instruction.</p> <ul style="list-style-type: none"> <li>• This element was typically described/needed on per-student, per-day basis</li> <li>• It was typically described as having both historical and future values to cover at least the next major instructional period</li> </ul>	<ul style="list-style-type: none"> <li>• to know where and how the student will receive instruction in the future, for resourcing and planning purposes</li> <li>• to ensure equity in instructional delivery and outcomes</li> <li>• to help drive improvement in instructional programs and delivery.</li> <li>• to meet state reporting requirements, for districts</li> </ul>
<p>The method used to verify attendance for students in “remote” and generally “online” instruction.</p> <p>For example, in some districts, “remote” attendance is verified through attendance at a synchronous online meeting, and in others through assignment completion. In other cases, districts have a rubric of possible / multiple methods.</p>	<ul style="list-style-type: none"> <li>• to drive the use of local and state policy or rubrics for verifying attendance</li> <li>• to meet a potential state audit of state data collections or requirements</li> </ul>

## Student Modality Data in Ed-Fi

### Data Model

The Alliance recommends that student modality be captured using the following elements. Data specifications asserted publicly – such as those from SEAs – should describe their requirements using the following entities.

Element	Data Handbook	Usage Notes
Program	<a href="#">Version 3.2.0-c</a> <a href="#">Version 3.1</a>	<ul style="list-style-type: none"> <li>SEAs should define their collections using <b>ProgramType</b>, and SIS systems map to state <b>ProgramTypes</b> for reporting</li> <li>LEAs should use <b>ProgramName</b> and <b>ProgramType</b> to reflect local values. e.g. “Virtual”, “Hybrid A”, etc. This should be achieved primarily by custom values for the <b>ProgramType</b> descriptor.</li> </ul>
StudentProgramAssociation	<a href="#">Version 3.2.0-c</a> <a href="#">Version 3.1</a>	<ul style="list-style-type: none"> <li><b>BeginDate</b> and <b>EndDate</b> should both be populated for all historical records</li> <li>In ongoing collections, <b>EndDate</b> can be left open to reflect the current and future student modality, though setting <b>EndDate</b> to the end of the current term is recommended for clarity and data quality</li> <li>The records for each student should cover all days for the school instructional calendar that applies to the individual student; we recommend not working by assumption of a “default” state, to improve data quality</li> <li>If it is necessary to capture transition reasons, use <b>ReasonExited</b> descriptor with applicable local value set</li> <li><b>ParticipationStatus</b> should not be needed, as it mainly applies to federal programs where there are workflow statuses that are tracked. However, this element should be used if it is desirable or necessary to track multiple statuses beyond “Active in Program”</li> </ul>

In support of these recommendations, the Alliance makes another recommendation: do not repeat the mistakes of the past. Per the “call to action” above, SEAs, LEAs, and vendors should urgently come together to collectively determine how student modality data will be recorded in the system of record and the specific format and data structures that will be used to collect data from LEAs to SEAs. If the current state of collecting and reporting student modality data continues, the burden on SIS vendors, LEAs, and SEAs to obtain high quality data and make it useful will be very high.

#### Guidance

School districts should work with their SIS providers and SIS providers should work with their district customers, to coordinate on supported models within the SIS that support Ed-Fi data integration described above. In Ed-Fi states, SEAs should play a leading role in this work.

In our research, we have learned that school districts have taken highly individualized approaches to data management within their SIS, often relying on custom fields or features that were convenient to meet needs under COVID operations.

For a SIS system to meet each individual customer where they are today will be very difficult. It is important that SIS systems and their customers clearly align on fewer models for this capture in order for the data representation in Ed-Fi to work.

State agencies can also play a leading role in this work, in their communications with and work with SIS systems

Each state producing their own data specifications for collecting this data increases the burden on SIS vendors and LEAs to ensure that they can report accurate data.

It increases the risk that the data the state receives is unintentionally inaccurate and not useful for decision making support.

It is not the Alliance's role to say how the data should look in the SIS, but from our research the Alliance saw the greatest promise in these SIS data structures:

- The canonical method for student instructional modality capture as described – and often recently released – by the SIS (see “Finding #2” section below)
- Methods that use SIS representations of local programs: these are likely mapped to Ed-Fi entities above already

What is best for each school district and their provider will vary of course and may not be one of these.

### **REST API Bindings**

The recommended Ed-Fi elements have the API bindings shown in the following documents. See the API resources for /programs and /studentProgramAssociations to see how the Ed-Fi Data Standard model is reflected in JSON.

- Data Standard v3.2.0-c: <https://techdocs.ed-fi.org/display/EFDSRFC/ED-FI+RFC+24+-+CORE+STUDENT+API>
- Data Standard v3.1: <https://techdocs.ed-fi.org/display/EFDSRFC/ED-FI+RFC+20+-+CORE+STUDENT+API>



## Student Attendance Data in Ed-Fi

### Data Model

The Alliance found no data model gaps for representation of new attendance data. It should be described and captured using the following standard entities.

Element	Data Handbook	Usage Notes
StudentSchoolAttendanceEvent	<a href="#">Version 3.2.0-c</a> <a href="#">Version 3.1</a>	<ul style="list-style-type: none"> <li><b>AttendanceEvent.AttendanceEventCategory</b> captures the code used by the agency, including any new codes added under COVID</li> </ul>
StudentSectionAttendanceEvent	<a href="#">Version 3.2.0-c</a> <a href="#">Version 3.1</a>	<ul style="list-style-type: none"> <li><b>AttendanceEvent.AttendanceEventCategory</b> captures the code used by the agency, including any new codes added under COVID</li> </ul>

However, to improve ecosystem collaboration, we do have some recommendations:

Guidance #1	<p>LEAs should consider adopting positive + negative attendance if a district assesses that data on the method of verifying attendance (e.g. via assignment, via synchronous meeting, etc.) will be of high importance to future needs, and especially for state reporting or auditing.</p> <p>This should be done via adding custom codes for <b>AttendanceEvent.AttendanceEventCategory</b></p>
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Often state and local policy is important to making this decision, but there could be program improvement or research goals as well.

This practice may not be applicable: if a district is requiring that all remote attendance is verified by a synchronous daily meeting, then there is likely less value in positive attendance capture.

However that was not true in all cases, and we noted in a few cases that data on the means of verification was simply being lost. Given that states specifications and policy is still in flux, this data may be required for those collections or for audits.

If a district provides a variety of verification methods and predicts it will be interested in how teachers operated and taught based on that, this data might be important to gather. In addition, some other respondents who were using positive + negative attendance noted that they were doing so as they saw it as critical to improving data quality.

Districts that do gather this data should however consider the operational costs to doing so (e.g. increased burdens on teachers to mark attendance, etc.) and the effort and risks involved in changing processes.

### Guidance #2

Do **not** use positive + negative attendance as the primary means of capturing student modality.

Instead we recommend that organizations capture student modality using the method described above that relies on **Program** and **StudentProgramAssociation**.

In our research, we ran into a case where a district was using attendance codes to determine modality. This model has some key weaknesses:

- It explodes the number of data records required and the processes necessary to maintain those records.
- It is not effective at showing future or current student modality, which likely leads to data quality issues and data tracking in outside systems (e.g. in spreadsheets external to the SIS)

### Guidance #3

Continue to use **StudentSchoolAttendanceEvent** and/or **StudentSectionAttendanceEvent** to capture attendance.

Do not use **StudentProgramAttendanceEvent** for daily attendance even if you are modeling student modality as recommended above (using **Program** and **StudentProgramAssociation**).

There are 2 reasons to avoid **StudentProgramAttendanceEvent**:

- In collecting attendance events the school district use case is focused on daily attendance for general instruction, **NOT** on attendance to services specific to the program itself. Therefore, the semantics do not match the case.
- SIS systems supporting Ed-Fi have universally not implemented **StudentProgramAttendanceEvent**; for example, this element is not included in the Core Student API specification nor in Ed-Fi certifications that use that specification.

### REST API Bindings

These elements have the API bindings shown in the following documents. See the API resources for `/studentSchoolAttendanceEvents` and `/studentSectionAttendanceEvents` to see how the Ed-Fi Data Standard model is reflected in JSON.

- Data Standard v3.2.0-c: <https://techdocs.ed-fi.org/display/EFDSRFC/ED-FI+RFC+24+-+CORE+STUDENT+API>
- Data Standard v3.1: <https://techdocs.ed-fi.org/display/EFDSRFC/ED-FI+RFC+20+-+CORE+STUDENT+API>

Note that this API has no binding for **StudentProgramAttendanceEvent** (though the Ed-Fi ODS API does have a binding) – as stated above, it is not covered in Ed-Fi certification or implemented universally by SIS systems.



## Other Findings by Stakeholder

### Student Information Systems

Most SIS systems support both “positive” and “negative” attendance and their combination.

- SIS providers reported that nearly all (but not all) districts only use “negative” models, though positive is sometimes used in special cases (e.g. specific schools and program with additional reporting needs)
- SIS systems are also sometimes not optimized to support “positive” or “positive and negative” models. For example, UX support for teacher interfaces may be weaker or non-existent for positive attendance taking, or additional configuration required by administrators.

### School Districts

A few school districts had resolved the problem of modality capture by organizing students in remote instruction into a new and separate “school.” This “school” was reflected in the SIS as a “school”, but more interestingly seemed to be highly operationalized in district processes as well: e.g. teachers were “assigned” to the new school, movements from “remote” to “on campus” instruction would be operationalized as a “school transfer”, etc.

While the central purpose of our research was to understand the data needs and process and not to categorize or analyze nuances in how districts were organizing their instruction, we did find in our sample a “modal” LEA approach:

- The modal practice was to have students in 2 categories: a “remote” category and a “hybrid” category
- “Remote” students were entirely remote – i.e. not reporting to campus and receiving instruction primarily online
- For “hybrid” students, the modal district has 2 cohorts. Each cohort is on campus 2 days and off campus 3 days. Generally, a cohort’s on campus days were organized either as
  - Monday + Wednesday or Tuesday + Thursday (Friday is a “remote” day for all), or
  - as Monday + Tuesday or Thursday + Friday (Wednesday is a “remote” day for all)

## State Education Agencies

Half of the states we spoke to are or will be collecting student modality and half are not. Among those who are not, some of them cited a need to collect the data see it as a possible future requirement, due to possible legislate mandate or other state business requirement.

On the shape of the modality data:

- The dominant pattern was to collect the data on a per student per day basis, matching a basic pattern in the SIS canonical feature
- One state was collecting this data in aggregate form and using a snapshot approach – i.e. collecting aggregate data “as of” certain submission dates
- One state had plans for capturing modality via attendance codes

States are universally not using school calendar entities to capture the student modality. However, a few states have added “instructional modes” to their calendar events to capture how a given school is operating on each calendar day.

On attendance collection, most the states are collecting daily attendance as negative only, and they predicted no change to that for the 2020-21.

- A minority of states are collecting both positive and negative attendance, and cited “accuracy” / data quality as the driver or the need to capture modality.
- Even if only using negative attendance, all states have added additional codes that reflect modality, such as “Remote-Synchronous Absent” or “Remote-Asynchronous Present” (if using positive attendance).







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