

# K-12 Buyers Guide

Automating Student Attendance Tracking

For K-12 Educators

**Discover what you need to know about attendance automation:**

- Identifies the challenges of attendance tracking
- Explains the attendance information flow
- Reveals the typical attendance automation scenarios
- Introduces the attendance technology landscape and hardware options
- Know what you need to consider when buying an attendance automation solution



## K-12 Buyers Guide

Welcome to the attendance system buyers guide which will help you work your way towards successfully automating attendance capture at your school!

This guide has been prepared based on our research and experience with attendance tracking technology options. In this guide we explore some of the key reasons for taking attendance in K-12 schools, challenges, and the technology options available for automating attendance tracking.

This guide will be valuable if you're evaluating attendance automation options, whether you want to track attendance for your school as a whole, individual class rooms or lunches.

## Why is Tracking Attendance Important?

- **Funding** - Funding is based on student attendance in many states. Being able to correctly collect, and report this data ensures that the deserved funding is received.
- **Student tracking and safety** – Keeping track of students is just as important for safety as it is for academic achievement. Know if a student is absent, if it's been for the whole day, or if they have been at school all day and have now not shown up to class. This can extend to after school programs or sports.
- **Resource utilization** - Accurate information on how many students are using the room at any time enables you to know which rooms are vacant, under-utilized or over utilized and when. Resource utilization can help with planning and time-tabling.
- **Student success** – For most students, there is a correlation between their achievement and attendance. It makes sense that students who attend more classes learn more. Knowing which students are late to class or skip class, helps you target your early intervention activities.
- **Lunch** - Some schools provide free or discounted lunch for some students, but need to prove that the student is receiving their meal.

## Attendance Challenges

Attendance is typically taken by teachers at the start of a school day for junior school. For middle and high school, this attendance can be taken at the beginning of each period. This process is time-consuming and disruptive because if a student is tardy, the teacher must stop to record (or remember it for later). Many Student Information Systems (SIS) now facilitate the manual entry of attendance directly into the SIS; it may be slower than using paper and pen.

Many teachers take attendance quickly during class using Excel, or pen and paper, then transfer it into the Student Information System (SIS) at the end of the day or week.

### Manual attendance tracking presents some challenges:

- The teacher may misplace the attendance paper or excel file they were using.
- Attendance is not kept in real time, so cannot be used for monitoring students skipping class, or ensuring no students have gone missing during the day.
- Teachers, lose a lot of time cumulatively taking attendance manually.
- Classes can be disrupted by a late student, as the teacher must stop and record student as attended late.
- Teachers don't want to take attendance; some of them don't feel like it is part of teaching so try to get it over and done with as fast as possible, risking accuracy.
- The larger the class, the greater the challenges.

## Attendance tracking is perfect for automation

Moving attendance to an automated tracking system can address many of the pains associated with recording attendance.

- **Automation requires little or no teacher class time.** Students can scan in as they enter the school and / or classroom.
- **Rules around lateness can be defined** to mark late comers or truants. Depending on your SIS, various alerts could be triggered by constant lateness.
- **Administrators can see real-time, accurate attendance.** This is powerful because faculty can call parents to follow up on absent students, and quickly notice if any students have disappeared between classes.
- **Accurate attendance reports when you need them** from your SIS. No more time spent chasing up teachers to complete attendance or query anomalies.

When evaluating automation options, it is critical that the chosen solution works for all students. For example, take care when evaluating solutions dependent on each student having a charged smart phone or a phone of a particular type, as this is unlikely to be feasible across the entire student population.

## Where is your data coming from, and where is it going?

**Data flow** is an important aspect of an automated attendance system. It is likely that you already have a SIS of some type, possibly also coupled with a learning management system (LMS). You may also have a separate timetable management system. These systems hold your source data, which includes student and scheduled classes, which needs to be utilized in the process of tracking attendance.

There needs to be robust integration between systems so that the attendance records can automatically be reconciled against the right students in the right system for the right scheduled class.

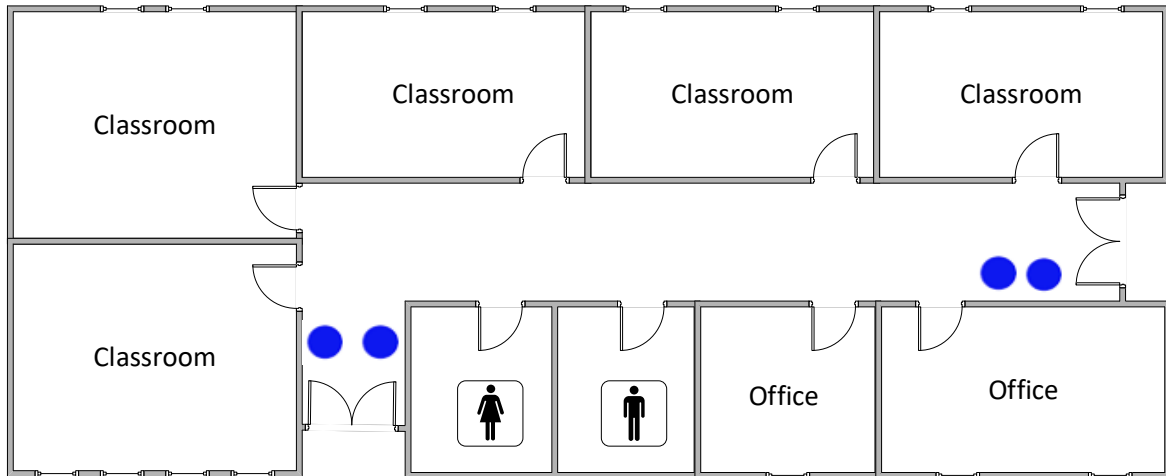
Servers	Considerations
<b>Local / On-site</b>	An on-site server will process the incoming scans and direct them to your SIS. If you do not already maintain servers, this will add cost through infrastructure and maintenance to your IT budget.
<b>Cloud</b>	Cloud-based allows you to subscribe to a service that provides the application hosting, maintenance, backups and guaranteed uptime/redundancy.



# K-12 Attendance Automation Scenarios

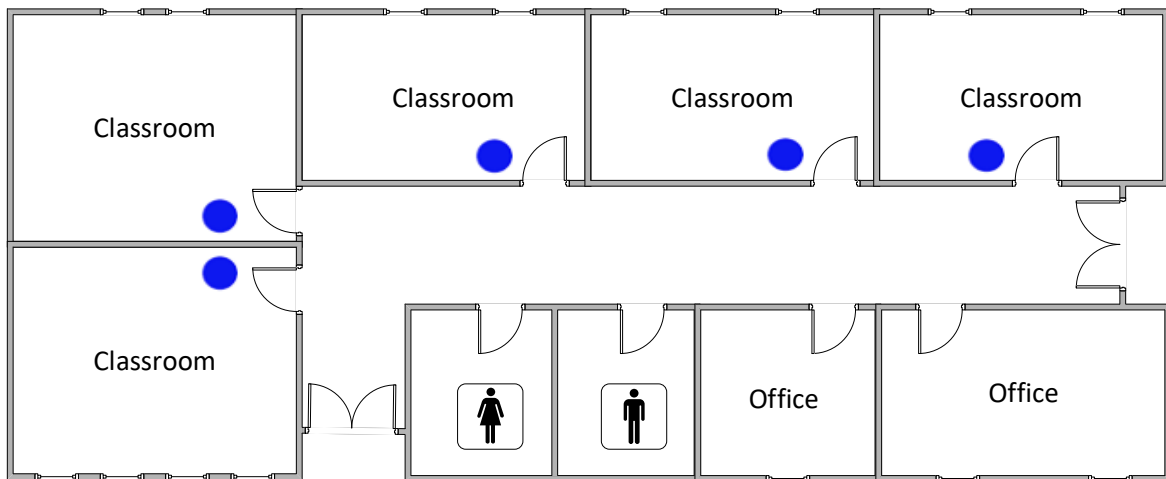
## Monitor school or building entry (and exit)

To determine a student arriving for the day and returning into the building after recess/lunch.



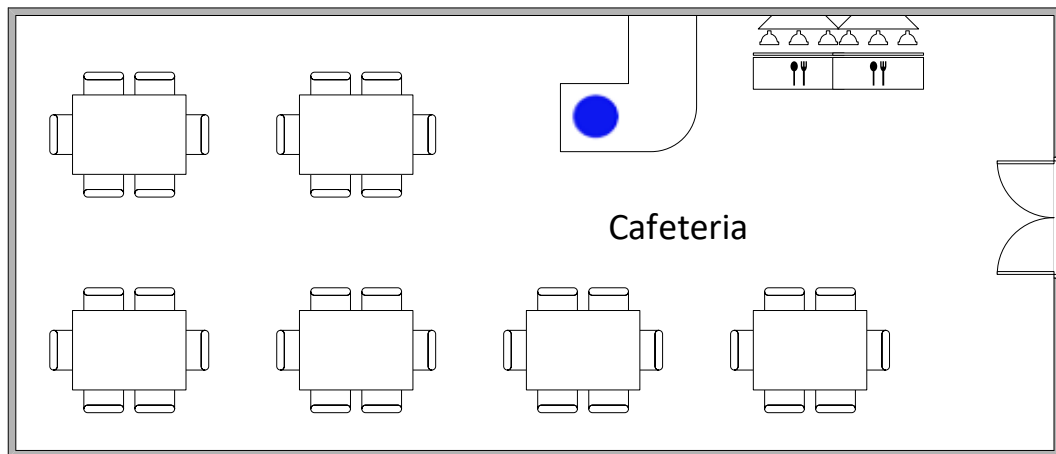
## Monitor classroom / lab entry (and exit)

To determine a student arriving to specific classes at specific times.



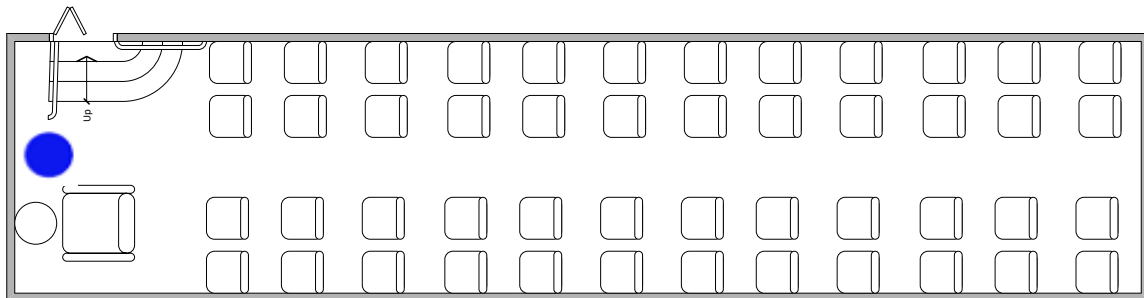
## Monitor other aspects of the school day where attendance is required

Such as the recording of recipients of state supplied lunches in the cafeteria, or reporting to a particular office.



## Monitor school bus ridership

Recording when and where a student gets on and off the bus.



# The Attendance Technology Landscape

There are a variety of technologies which may help to track student attendance. Some of these options do allow for students to circumvent the attendance system. Our experience has shown that only a small subset of students would actively try this, generally a subset that is well known to teachers as troublemakers. A teacher could check very quickly via an internet capable device if the recorded attendance correlated with who was in the room. There are options around requiring a scan out as well.

## NFC / RFID

A small contact-less tag that can be built into student identification cards, key fobs, and even stickers. These allow students to scan their card past a scanner without removing it from their wallet or lanyard. This makes it possible to scan several students within a short time. Active RFID is a related technology which uses bigger tags that can be scanned by passing near a reader rather than being taken close to the device. Most NFC scanner hardware is not designed with student attendance tracking in mind.

## Magnetic Stripe

Use of a magnetic card reader to read the magnetic stripe on a card. This can cause delays when many students are trying to get into a room. Students will also have to get the card out of any holder to run it through the reader, causing wear to the card.

## Barcode / QR Code

Use of a camera or laser barcode reader can also cause delays at classroom entryways. Sometimes barcodes can also be difficult to scan. The cards need to be orientated a certain way, and may not work if in a plastic holder.

## Biometric (finger print scanning)

On the surface this seems like an accurate and fool-proof method for ensuring that a child is in a location. However biometric systems use fuzzy logic and degrees of accuracy to match fingerprints. The suitability of biometric solutions needs to be carefully checked for reliability, consistency and speed. There are also concerns about storing the personal biometric data of students. Some options use biometrics data to validate that a student is swiping the correct card. In that case the biometrics data is stored on the student's card, not a central server.

## Face Recognition

Technology has not advanced enough to make face recognition a cost effective method of attendance tracking in schools. Options include having a camera at entry ways or a camera which can scan a class room.



## Geo-fence (Using Bluetooth/Bluetooth LE/iBeacon/Wi-Fi)

By having a centralized hub for each classroom, students can be marked as attended by the hub sensing their phone. While this removes cards from the equation, it does presume that students will always have their phone on them, charged, with the relevant service activated. This works for building or school attendance, and not class by class, due to its extended range. A similar technology called iBeacon can also be used, however, this shares the same weakness as geo-fencing, and impersonating an iBeacon is simple.

## How do the technologies compare?

Technology	Contactless?	Speed of Scan	Card Resilience	Location Accuracy	Risk of Impersonation
RFID	Y	Fastest	High	High	Medium (Student can bring others card)
Magnet Stripe	N	Fast	Mid	High	Medium (Student can bring others card)
Barcode or QR Code	Y	Slow	Mid	High	High (Students can photocopy barcodes)
Biometrics or Face Recognition	Y	Depends	N/A	High	Low
Geo-fence	Y	N/A	N/A	Low	Medium (Student can bring others device)





# K12 Attendance Technology Hardware Options

There are several common choices with hardware selection and configuration.

## Laptop connected to scanner via USB cable

Many 'off the shelf' USB scanners can read magnetic strip, barcodes, and RFID. This can be the fastest way to digitize the attendance, with the resulting scan being directed into a desktop application such as Excel.

### Pros

- Fast startup and off the shelf hardware

### Cons

- Laptop must be maintained and kept updated
- May not be desirable to be left unattended due to easy tampering
- Laptop or components could be stolen
- Not scalable



## Tablet or Smartphone Based System

Mobile devices can be used to automate your attendance in several ways. Barcodes can be read using the onboard phone/tablet cameras. Most devices now come with RFID readers built in. With the right app, these can be translated into attendance recording devices.

### Pros

- Extremely mobile, a good option if you are using one device to record attendance in different locations.

### Cons

- Cannot be left unattended
- Requires updates and charging
- Have to scan from the back of the device

## Specialized Attendance Scanners

Attendance scanners that have been specifically designed to enable the tracking of attendance.

### Pros

- Hardware device, requiring no updating or maintenance
- Wall or desk mounted
- Ethernet or Wi-Fi connectivity to prevent infrastructure installation
- Can be left unattended, fully automated

### Cons

- The vast majority are designed for tracking employee attendance (time clock) and to control door entry, rather than for tracking student attendance in education. This means many hardware devices are slow and not designed to integrate with educational systems.

## Existing Access Control System

If you have electronic door locks on rooms, that require a card access, then it is possible that these systems will be able to integrate with an attendance system. Integration would be required to convert the scans into attendance (Tardy, absent, etc.). However, these systems are not designed for tracking attendance and re-purposing them for this may not be possible – check with your vendor.

## Hardware Considerations

Unit Type	Considerations
<b>Accessory</b> (Connected to a computer via USB)	This option requires a PC at every scanner/reader. Requiring that the PC is kept updated and maintained. Increasing costs in the long term. The chances of failure double, as you have the PC and the scanner to keep running.
<b>Standalone Unit</b> (Network/Internet connected)	Standalone unit handles scanning data and data transfer automatically, with direct connection to the network or internet. Data processing handled by a centralized server or cloud service.
<b>Mobile Device</b> (with RFID built-in)	Similar to a stand-alone scanner, with an advantage that it can be highly mobile, allowing for attendance to be recorded outside of the classroom or lecture theater environment. Any mobile device with a camera can read barcodes and QR codes, most android devices now contain a built in RFID reader as well.



## Buying soon? Things to consider

These are the questions to ask and points to consider as you navigate towards a solution. You don't need to know all the answers right now. It will help to be aware of what may be asked of you.

### Data flow

- Where is your student and timetable data currently? Which SIS do you use, and is information stored within your school or in the cloud.
- Is your student data accessible – does your SIS provide an API or other way to obtain student and timetable information?
- Where do you need the student attendance records to be stored?
  - In your SIS?
  - If your SIS is not accessible, consider if you would be happy to have attendance records managed by third party software

### Card management

- If you plan to use cards for students to scan in and out, how will you manage the cards, and those that are not scanned? There needs to be awareness of which cards have been assigned to which students.
  - In SIS? (SIS may not have a facility to manage card information)
  - In third party attendance software?
- If you are already using cards, consider if they will work for automating attendance. Are your cards RFID/ NFC and do they support a common protocol such as MIFARE® or FeliCa®?
- How will new replacement cards be handled?

### Time-tabling and tracking

- Do you need to scan by day or half day or class?
- Do you need to track attendance for each individual class room?
- Do students need to scan out?
- How will approved absences be handled?
  - Student Information System
  - Third party attendance software
- How will attendance be recorded for students who lose their cards?
- What kind of triggers and actions do you require as a result of attendance? Do you need absences to trigger notifications of some kind?
- Do you need to be able to disable or override the automated attendance (and notifications) at short notice - such as for an unscheduled snow day or teacher day?

### Hardware and infrastructure

- How many scanners do you need and where will they be placed?
- Do you have Wi-Fi, or would you prefer Ethernet / PoE connection?

## Attendance automation success can be found here

Founded in 2004, Cobek has developed aPlus+ Attendance - sophisticated solutions for higher education institutes focused on student attendance tracking. We make it easy for education institutes such as schools, colleges and universities to benefit from specialist attendance monitoring solutions alongside their existing software infrastructure. With simplified student information system integration, our solutions instantly enable you to effectively track and monitor student attendance.



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