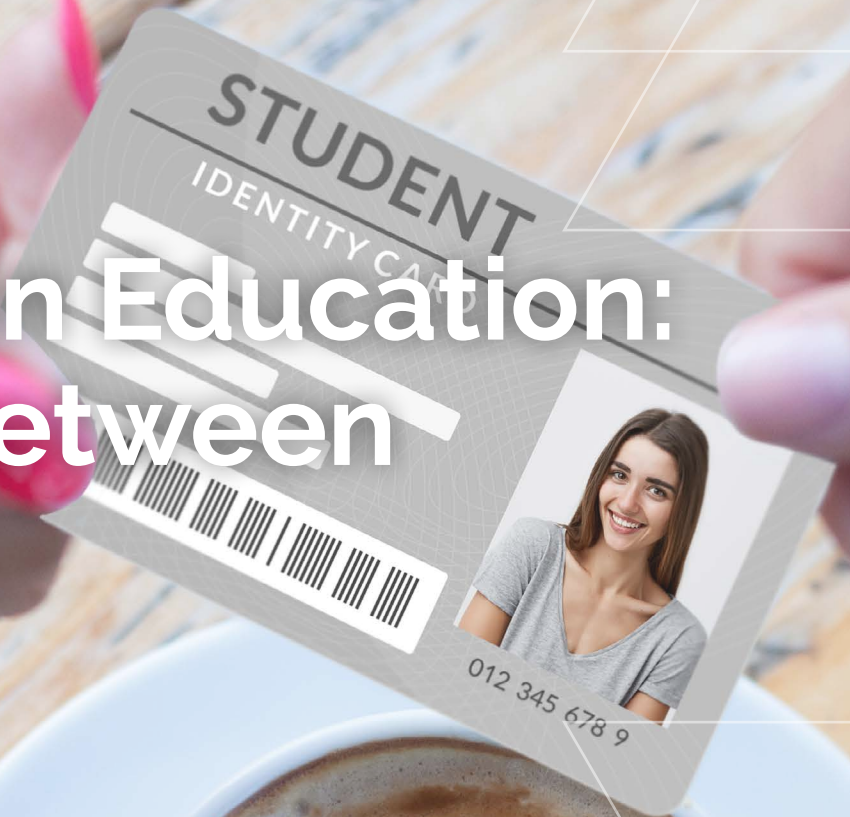


Barcodes in Education: Reading Between the Lines




We've tackled some of the top challenges post-secondary schools encounter when deploying the straight-and-narrow benefits of barcodes. Now let's focus on reading between the lines — adopting the right techniques and technologies to help track student spending, empower resource access, and ensure educational identity at scale.



IN THIS EGUIDE, WE WILL EXPLORE:

- Complex Data Management
- Eliminating Data Errors
- Reading Damaged Barcodes
- Barcode Integration



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Complex Data Management

Post-secondary environments are naturally complex. The interplay of staff and student access across multiple physical and virtual environments reduces operational transparency, making it difficult for schools to fully catalog and control educational assets. The introduction of both student-owned and IT-managed digital resources adds another layer to this environment. As noted by the [Educause Review](#), it creates complexity on par with biological systems that are “constantly in flux and the ways forward are not clear, but rather, emerge as agents interact with their environment.”

Barcodes offer the potential to act as complexity-reducing agents in post-secondary systems

by empowering schools to track and catalog individual resources as part of the larger whole — rather than isolated instances. However, barcodes alone aren’t enough to undercut complexity; schools need robust software tools capable of creating an easily-accessible code database that both supports ongoing additions and helps administrators track the movement of digital and physical resources across campus.

Here, reading between the lines means understanding that while barcodes provide the underlying function required to reduce complexity, it’s also critical to overlay a structured software format for effective management at scale.

Reading Damaged Barcodes

The scope of barcode-enabled campus ID programs is expanding. Consider long-term plans from schools like the [University College Cork](#), Ireland, which already offers smartcard payments, library borrowing, car parking, and access control functionality. To enhance functionality, Cork has plans to empower self-service functionality for ID card reprints on-demand that can be requested from any authenticated device or PC.

The challenge? More complex ID cards — such as those with QR codes or electronic chip-and-PIN designs — are more labor and time-intensive to produce. In addition, students must pay for each reprint, making this an expensive proposition over time.

Although card loss certainly accounts for some of this ongoing ID demand, there's a bigger barcode problem: damage. Cards carried in wallets and smartphone cases or left to tumble around backpacks as students rush across campus to their next class are more prone to becoming damaged.

If scanners can't read key data, they become unusable. While programs like those in development at Cork help bridge the gap, there's another key component to consider. Next-generation barcode reading solutions are capable of extrapolating critical data from damaged barcodes, in turn extending the usable life of educational IDs and reducing the financial burden on both students and university systems.

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Eliminating Data Errors

Barcode errors impact efficiency. If codes aren't printed properly or are misaligned on cards, the results are both immediate and frustrating. Students may not be able to self-identify at exams, access transit options, or use their meal plan.

While barcode printing seems straightforward, basic codes are just black lines and white spaces after all. **Printing Impressions** points out there are multiple factors that contribute to overall quality, including:



PRINTING RESOLUTION

The higher, the better, but also the more resource-intensive.



INK TYPE

Better ink is more resistant to cracking, fading, or flaking.



CONTRAST & SUBSTRATE

The color and quality of ID cards will significantly impact the ability of ink to adhere and the ability of scanners to read card information.



PRINTING ENVIRONMENT

The age and capacity of card printers combined with the overall cleanliness of the printing environment will impact the final product.



BARCODE DESIGN

How big is the barcode? How complex? Is code design standard across campus?

Without the ability to manage a high volume of new cards on campus, most schools turn to outside providers, which vary significantly across the factors listed above. This means that cards may be misaligned or misprinted, or may not have quality ink. Codes may be hard to read, or certain portions may begin to wear more quickly than others.

To ensure campus devices can always read between the lines, it's critical to rely on barcode-scanning software that not only supports multiple code types but also accounts for missing or misaligned data.



Integration empowers post-secondary institutions to read between the lines — or dots, or hexagons — and assess emerging campus trends. ”

Barcode Integration

[Barcode scanning](#) is 99.9999 percent accurate, empowers indexing and storage, and can help deliver on the potential of digital transformation. With barcodes now storing more data — from student names and addresses to medical data, payment information, and even social security numbers (SSNs) — they’ve become more complex. One-dimensional barcodes have given way to [layered, 2D barcodes](#) that often include squares, hexagons and dots to encode information and often store more sensitive or robust data.

As a result, it’s not enough to leverage barcode scanning to grant facility access or track meal plan spending to increase campus efficiency. Long-term value of these codes stems from their ability to integrate student data at scale, in turn allowing staff to both assess current operational trends and predict emerging patterns.

For example, using cards as public transit passes means one less thing for students to carry and reduced complexity for transit operators. Going beyond data capture to integrate this information — such as metrics around how many students take which bus at what time — helps identify key traffic patterns and make recommendations to local transit authorities about evolving student use.

Put simply, while barcode scanning offers advantages in isolation, integration empowers post-secondary institutions to read between the lines — or dots, or hexagons — and assess emerging campus trends.





Ready to learn more about educational barcode
advantages? Check out the next eGuide,
The Benefits in Black and White.

