

Digital Collaboration and Classroom Practice

Educator Use of ARIS Connect



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Introduction

The use of new technology in schools has exploded in recent years, with many millions of dollars invested by governments, philanthropies, and for-profit companies. A 2012 survey of educators showed growing acceptance and use of education technology (“Ed-Tech”) tools to support classroom instruction and communication among teachers (MMS Education 2012). But along with these new resources come new challenges, as educators must find and then master the most useful tools. Similarly, school districts must figure out how to provide technology resources that hold real promise for improving teaching and learning.

In 2008, the New York City Department of Education (DOE) rolled out the Achievement Reporting and Innovation System (ARIS), an online platform designed to help teachers and administrators improve classroom practice and better manage schools. ARIS is made up of four components: ARIS Data, for viewing and analyzing information (e.g., student biographical information and transcripts); ARIS Parent Link, which provides parents with information, including student transcripts, test results, and attendance records; ARIS Learn, which includes professional development tools, such as video trainings; and ARIS Connect, designed to encourage collaboration among educators through resource sharing and online discussion.

ARIS was an early attempt to build a district-wide data system for school administrators, teachers, and parents, and was a major undertaking for the nation’s largest school district. In 2011, the Research Alliance for New York City Schools received a grant from the Spencer Foundation to investigate how this ambitious initiative played out in schools. Our 2012 report, “Usage Patterns and Perceptions of the Achievement, Reporting and Innovation System (ARIS)” (Gold et al. 2012) provided the only comprehensive, independent examination of how much and in what ways ARIS and its constituent components were being utilized by NYC educators.¹ We found that ARIS was used widely. Roughly three quarters of all NYC teachers and administrators logged on at least once during the 2010–2011 school year, averaging 21 visits per user. However, most users logged on for only brief periods—five minutes or less per session. A much smaller group of users spent more time on ARIS. In fact, about one quarter of users accounted for three quarters of all time

logged on the system. Most of these heavy users were administrators and teachers who carried school-wide planning responsibilities. In keeping with these findings, teachers reported in surveys and focus groups that the data and tools available in ARIS were generally not helpful for informing classroom instruction.

In short, our first report found that ARIS was used primarily for administration and planning. Yet, one of the DOE's central goals in developing the system had been to provide a tool to help educators "improve their practice, and increase student achievement" (NYC DOE n.d.). In the second phase of our ARIS study, we aimed to investigate the extent to which ARIS had met this major goal—and what barriers might have impeded meeting it—by honing our focus on ARIS's relationship to classroom learning, and by examining how teachers in particular use ARIS. In this brief, we focus on ARIS Connect, the component that appeared to hold the greatest promise for informing instruction, and that was most specifically designed for this purpose. Connect includes tools that let educators post teaching materials, notes, ideas, or questions, and read, download, or respond to posts from other educators in their school or throughout NYC. It was conceived to facilitate knowledge sharing, defined by the DOE as "the practice of identifying, capturing, and disseminating experience and innovation" (NYC DOE 2013c).

Findings and Recommendations in Brief

ARIS Connect was designed to help educators improve instructional practice, but most teachers in our study did not perceive Connect as a helpful resource. We found that:

- Administrators and teachers with school-wide roles used Connect much more heavily than teachers who did not hold school-wide roles.
- The educators who used ARIS Connect most frequently did so because they felt it was required as part of the NYC DOE's Inquiry process (in which teams meet to develop and refine data-based strategies for addressing the needs of struggling students).
- Educators reported a number of obstacles to using Connect, including confusion about its purpose, a lack of training, and technical challenges.
- Educators use other online tools to fill three basic functions: communicating with students, sharing files, and searching for resources.

To improve the next generation of tools aimed at informing classroom instruction, leaders in NYC and other school districts should consider the following:

- Involve educators in the development process to ensure that products meet real needs.
- Provide sufficient training and professional development.
- Avoid developing redundant products that teachers can satisfactorily access elsewhere.
- Concentrate development efforts on areas where school districts are better equipped than private companies. For example, many teachers expressed a desire for a better link between educators and parents—something that districts are uniquely positioned to develop.

Given its collaborative nature, Connect's success depended on a high degree of interaction. However, our 2012 report found that ARIS Connect made up only about 20 percent of overall ARIS usage, with only a very small group of educators making frequent use of Connect. This project, the first in-depth study of ARIS Connect, sought to understand what educators who *did* use Connect thought of the tool, and whether, as its designers intended, Connect supported their ability to communicate with other educators and improve classroom practice. We visited nine middle schools that recorded higher-than-average use of Connect, where we interviewed administrators and held teacher focus groups. We focused on relatively high-usage schools in order to obtain substantive feedback about Connect, and to increase the likelihood of meeting educators who used Connect in their daily practice. In fact, even within these schools, we found many educators who rarely or never used Connect, which allowed us to learn about the obstacles that limited Connect use for so many educators. By including in our focus groups both educators who used Connect regularly and others who did so rarely or not at all, we developed a dataset capturing a robust range of educator experiences with Connect. This breadth gives us confidence that, although our study concentrated on a small number of schools, we have captured a meaningful sample of educator views on ARIS Connect. We analyzed the data we collected and developed this brief based on insights and themes that emerged across the schools we visited. For more details on our sample selection and methodology, see "About the Study" on page 5.

This brief summarizes the findings from our study, including how ARIS Connect was meant to be used, how it was actually used, and what educators told us they need from a collaborative Ed-Tech tool. By examining a range of experiences with and perceptions of Connect, we believe that our findings can illuminate important lessons about a first-of-its kind effort and inform the development of future tools for educators in NYC. We hope that understanding where ARIS Connect has been successful and where it has fallen short proves valuable in future DOE development efforts and in the context of a broader, national trend toward more web-based collaborative tools in education.

What Was the Purpose of ARIS Connect?

Web 2.0 Tools for Sharing Knowledge

One growing branch of education technology involves Web 2.0 tools, which allow users to “edit, comment, and share content” (Lemley 2009). By supporting this kind of virtual collaboration, Web 2.0 tools have the potential to drastically change the way educators exchange resources, information, and ideas (Moran et al. 2011). ARIS Connect was designed to enable “collaboration through Web 2.0 tools (wikis, blogs, discussion forums, communities) so that educators can share and refine best practices—describe what worked (or did not) when they tried to solve a similar problem” (Liebman 2010). By providing a convenient central place to share knowledge and promising practices, ARIS Connect was intended to improve efficiency and spark innovation in the classroom (NYC DOE 2013c).

Connect’s specific features include a resource library that allows educators and administrators to upload and share files (NYC DOE 2013c). Users have the ability to post and retrieve documents, including lesson plans, academic articles, rubrics, and other guides to support instruction. The library enables educators to find resources and, if they wish, share feedback. Those who have posted resources can look back, read comments from others, and then clarify or improve their contributions.

Connect also offers three additional collaboration tools: discussion boards, blogs, and wikis. The discussion boards permit users to post messages or respond to existing ones. ARIS users can also create blogs (online journals, typically with one contributor) or wikis (collaborative online resources, usually articles or other text documents, with multiple editors) on particular topics of interest. Both the blog and wiki functions allow users to post comments (TapCo 2013).

Every NYC teacher and administrator has access to ARIS Connect. Educators can choose to make their posts visible to ARIS users citywide or limit them to those in their school (NYC DOE 2013a). Alternatively, users can make private communities within Connect based on a shared interest, such as 6th grade math or the Common Core, which can include blogs, wikis, or other Connect features.

About the Study

How did we choose which schools to visit?

We selected our sample from among NYC middle schools, based on our finding that middle schools averaged more sessions and time on ARIS than either elementary or high schools (see Appendix Table B-1). We then selected a sample of nine schools with above-average use of both ARIS and ARIS Connect. Table 1, below, compares ARIS use and Connect use in our sample to all other NYC middle schools.

Table 1: ARIS Usage, Study Sample vs. All Other NYC Middle Schools, 2010-2012

	2010–2011		2011–2012	
	Our Sample	All Other NYC Middle Schools	Our Sample	All Other NYC Middle Schools
Sessions per school	3,307	1,104	3,067	1,283
Hours per school				
Total ARIS usage	287.3	86.1	216.0	85.4
ARIS Data areas	218.1	74.3	183.4	75.4
ARIS Connect	69.1	11.8	32.4	9.9
Number of Schools	9	255	9	251

Source: Research Alliance calculations from ARIS usage data and human resources data provided by the New York City Department of Education.

Who did we talk to?

In each school, we interviewed at least one administrator (principals, assistant principals, data specialists, or other staff) and conducted one focus group with teachers, all of which were audio recorded. Focus group participants were selected by school principals. In order to gain a well-rounded picture of Connect use in schools, we did not ask principals to select the most frequent Connect users. Principals tended to use two different sets of criteria to select teachers for our focus groups. They chose either 1) teachers who were available at the correct time, giving us a broader sampling of Connect usage, or 2) Inquiry team members, who were all familiar with Connect. In all, we spoke with 15 administrators and 46 teachers.

When did we visit schools?

In March and May of 2013. (No visits took place in April, when state tests were being administered.)

How did we analyze the data we collected?

Following each school visit, researchers wrote reflection memos. We analyzed all of the reflection memos using ATLAS.ti, a qualitative data analysis software, to code for recurring themes. To ensure inter-rater reliability, two researchers coded the same documents and then compared their results. When we had significantly different coding results, indicating a different understanding of key themes and discussion topics, we reviewed the memos together and, when appropriate, revised the coding structure.

For a detailed explanation of the methodology and coding system, please see Appendix A.

Support for the Inquiry Process

Another central focus of Connect (and, indeed, the rest of ARIS) was to support the Inquiry process that emerged in New York City public schools as part of the Children’s First reform initiative in the mid-2000s (Gold et al. 2012; New York City Global Partners 2010). As part of these reforms, every NYC school was expected to form an Inquiry team that would meet regularly to discuss strategies for addressing the needs of struggling students (Robinson et al. 2010; Talbert 2011). The goal was to create a forum for educators to monitor student progress using data from ARIS and, based on insights from that data, design and test interventions that might improve student outcomes (NYC DOE 2013b).

As part of the Inquiry cycle, teams were asked to record their work in the “My Inquiry Space” section of Connect—for purposes of accountability and also to share best practices with other educators (Robinson et al. 2010). In most schools, one user, usually the Inquiry leader, was assigned the role of updating this page following each meeting. Teachers and administrators could then use ARIS to track Inquiry meetings (Gold et al. 2012).

How Much Were ARIS and ARIS Connect Actually Used?

To determine how much educators used ARIS and ARIS Connect, we analyzed clickstream data for the 2010–2011 and 2011–2012 school years.²

We found that about three quarters of all NYC educators used ARIS at least once in 2010–2011. Numbers were similar in 2011–2012. In each year of our study, about half of NYC educators—or, two thirds of educators who were ARIS users—logged on to Connect at least once (see Table 2 below).

In terms of total hours, Connect made up only about 20 percent of total ARIS usage (almost all other usage was in the ARIS Data areas). Connect usage dropped 16 percent over the two years of our study (i.e., about four

Table 2: Percent of NYC Educators Who Used ARIS and/or ARIS Connect, 2010-2012

	2010–2011	2011–2012
ARIS users	76.5%	78.3%
ARIS Connect users	53.5%	53.0%
All NYC educators	90,398	89,390

Source: Research Alliance calculations from ARIS usage data and human resources data provided by the New York City Department of Education.

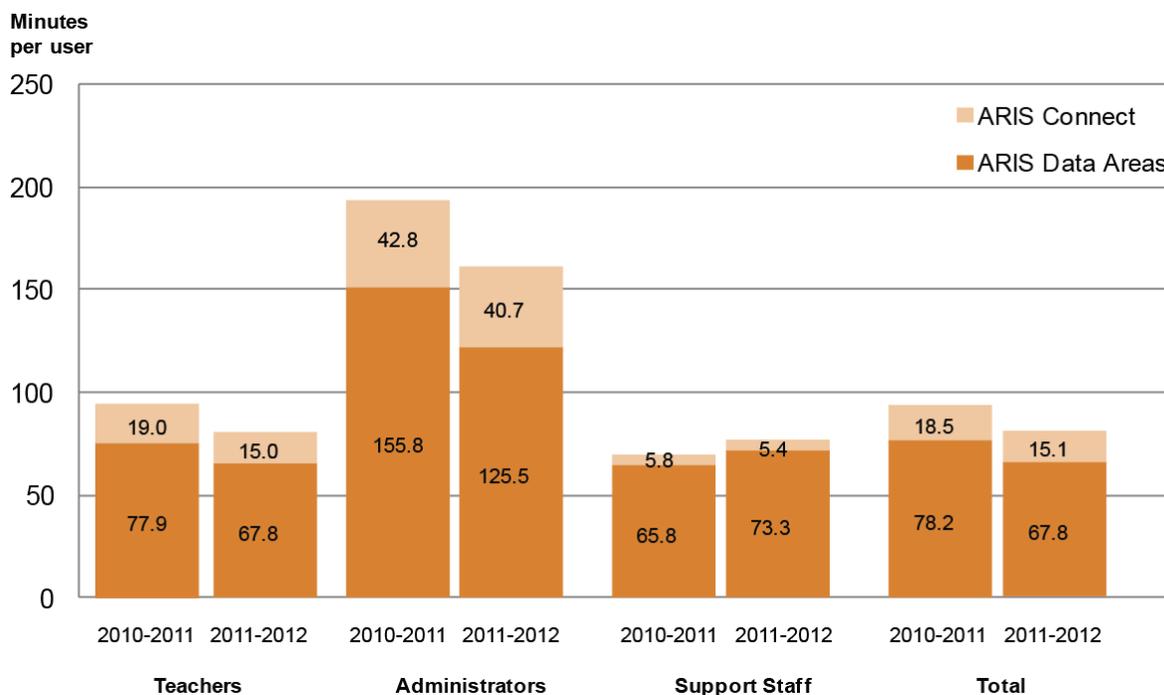
Note: Our count of the total number of NYC educators in each year has changed slightly since our 2012 report (Gold et al.) due to updates in our human resources files.

minutes per user) among educators who used Connect at least once. This change is similar to the drop in overall ARIS usage over the two years (Appendix Table B-2 includes detailed usage findings).

We also analyzed usage of ARIS and of ARIS Connect by job category. Notably, 90 percent of administrators (a category that also includes teachers with school-wide planning responsibilities) used Connect at least once. Administrators were the most prolific users of ARIS and of ARIS Connect, in terms of number of sessions, total hours, and minutes per user. Administrators averaged more than twice as many minutes per user as teachers, both for ARIS in general and for ARIS Connect specifically (see Figure 1 below, and Appendix Table B-2 for more details).³ Other types of school staff (e.g., office staff or guidance counselors) used both ARIS and ARIS Connect at much lower rates.

Overall, these data show that administrators and teachers with school-wide roles were much more likely to use Connect at least once and spent significantly more time there, compared with teachers who did not hold school-wide roles. These findings

Figure 1: Minutes per User, NYC Educators by Job Type, ARIS and ARIS Connect, 2010–2012



Source: Research Alliance calculations based on ARIS usage data and human resources data provided by the New York City Department of Education.

align with what we learned from educators during our school visits. The rest of this brief uses findings from those visits to unpack why teacher use of Connect was limited and why administrators used Connect more frequently. It also aims to shed light on aspects of Connect that were most and least promising in terms of improving classroom practice.

In What Ways Was ARIS Connect Used?

In the schools we visited, the primary use of Connect centered on the Inquiry process. In fact, of the nine focus groups we conducted, four were composed solely of Inquiry team members, and another four had at least one Inquiry team member.⁴ The Inquiry team members described using their Inquiry space in Connect to record information about their regular meetings, including meeting notes, steps taken to address student needs, and future plans. Administrators and teachers described this as a routine that took place during or immediately after the Inquiry team meetings.

Although Inquiry team members regularly recorded their meeting notes in Connect, we found little evidence that doing so supported the Inquiry process in meaningful ways or facilitated interaction with other educators. According to interviewees, the information that Inquiry teams added to Connect was rarely or never used for future reference. As one teacher said about a document her team posted to Connect, “I never looked back to see if anyone commented on it.” Another explained, “We [post] on Wednesdays because that’s when we meet. We talk about everything...and then, ‘Oh, we need to [post] it on ARIS,’ and it stops productive work to rewrite what we just said.” Overall, Inquiry team members agreed that they posted meeting notes for accountability purposes rather than for collaboration.

In focus groups that included teachers who were not part of an Inquiry team, a sizable majority had never used ARIS Connect or, in some cases, had never even heard of it.⁵ One teacher mixed it up with ARIS Learn, asking, “Are there teacher trainings on ARIS Connect?” After the researchers explained that the teacher trainings are found on ARIS Learn, the teacher quickly responded, “I never use [ARIS Connect].” Another teacher explained, “As far as ARIS Connect, I think the core Inquiry team...are the only people who have really looked at it.”

While ARIS Connect was used primarily as part of the Inquiry process, some educators also talked about using it for general resource sharing. Teachers and

administrators discussed posting worksheets, presentations, minutes from meetings, and other resources. For the most part, teachers described posting these resources privately to their school, forgoing the public posting option. As we found with the “My Inquiry Space” section, educators explained that they hardly ever revisited their previous posts to see if anyone had posted feedback, so if someone *had* commented, the original poster probably remained unaware. Some teachers described searching for resources a few times, but found that the process was difficult and the results mediocre, so they looked outside of ARIS.

We found few instances where ARIS Connect was used for the kind of spontaneous knowledge-sharing efforts within and across schools envisioned by the DOE. As discussed, most teachers who were part of their school’s Inquiry team started using Connect through the Inquiry process. Others started using Connect after a principal asked them to perform a specific task. A few others reported discovering it on their own.

Eight of the nine schools we visited did not make use of Connect beyond its most basic functions—recording Inquiry team notes, as required, as well as posting and downloading resources (the one exception to this is discussed on page 11 below). None of the teachers we interviewed used the blog and wiki functions.

What Were the Barriers to Using ARIS Connect?

Our research sought to uncover some of the reasons behind the limited use of ARIS Connect. We found that the main obstacles to using Connect fell into two categories: 1) lack of educator buy-in and engagement with Connect, and 2) technical issues with the ARIS Connect system.

Buy-In Challenges

- Educators Felt Connect was a Mandate

One of the primary complaints educators had about Connect was their sense that using it was required by the DOE. Carroll et al. (2003) found that if teachers perceive a knowledge management tool as a mandate, they may use it less.⁶ This idea frequently emerged in discussions about documenting the Inquiry process. It is possible that requiring all Inquiry teams to record their notes in Connect had the unintended consequence of creating a culture of (sometimes begrudging) compliance

Figure 2: What Prevents Educators from Using Connect?



around this part of ARIS, rather than a creative space for sharing knowledge. One teacher concisely described her team’s relationship to Connect, saying, “We’re using it because we have to use it.”

The sense of obligation seems to have waned somewhat over the 2012–2013 school year. Some teachers described an environment where the pressure to engage in the Inquiry process had become less intense than it once was, although we were unable to verify this independently. As one teacher described it:

It was a lot more prevalent than it is now. Inquiry has taken on a new shape. You don’t hear from anyone in the network or at another level where we’re required to maintain Inquiry team pages on [ARIS Connect].... It was a chore, we had to comply.

Instead, another teacher explained,

We’ve kind of gravitated from doing [Inquiry work] on the computer to doing it in our own team meetings...so things we would have previously done on ARIS Connect we’re now doing face-to-face.

- Educators Do Not Know Connect’s Purpose

We also found a general confusion among administrators and teachers about the overall purpose of Connect—specifically its Web 2.0 functions—including questions

about how and why to use the blogs and wikis, and how to integrate these tools into their workflow. Some teachers expressed that the goals of Connect had not been communicated effectively, including one who asked, “What is the mission statement of ARIS [Connect]?” Another teacher expressed a similar idea, saying: “I never felt that it was that useful.... It was never clear to me what the DOE’s purpose was in using it.”

We also heard from a handful of teachers in several schools that they did not understand what functions were available in Connect and, therefore, did not understand its intention or potential value.

- Educators Were Not Trained to Use Connect

The confusion around Connect’s purpose may be related to a lack of training and professional development for educators. This echoes findings from our 2012 report, where lack of training was cited by more than 70 percent of teachers as the main barrier to using ARIS (Gold et al. 2012), as well as findings in other studies of teachers beginning to use education technology tools (Buckenmeyer 2008; Ehrlich et al. 2011). Many of the teachers we spoke with described receiving training about ARIS Data when the software was first rolled out, but receiving very little or no training about ARIS Connect. As one teacher put it:

There was never really any professional development around what is available [in Connect]. I think...[it] would be key to just get an overview of “These are the functions and this is how you use it.”

Only one school described receiving any systematic training or an introduction to using Connect. In this case, the school’s data specialist sought out training on Connect and subsequently trained teachers. The school’s administration—particularly the principal and data specialist—provided strong support to teachers around using Connect, and it appears to have made a difference. Teachers in this school described using Connect on a regular basis to share resources among private communities structured around grades and subjects (e.g., a community for all 7th grade math teachers). This exception provides some initial hints about how training and professional development might have changed educators’ use of Connect; however, we would need more data to make a firm conclusion about this link.

- Connect Did Not Meet Teachers' Real Needs

Our findings showed that teachers did not feel a need for—and therefore did not use—the blog, wiki, or discussion areas of ARIS Connect. For example, in one school, teachers expressed a strong preference for face-to-face interaction. One teacher said, “Because we’re in constant contact with each other all day long, we don’t really have a need for the blog.” Another explained that, “I don’t find it necessary to write anything in terms of a blog just so [another teacher] could respond because we can just verbally speak to each other.” This may indicate that blogs and wikis are unlikely to be used as classroom instruction resources in this school or others where the school’s professional culture includes a strong preference for face-to-face interaction.

On the other hand, many educators expressed a need for functions that are not included in ARIS Connect. For instance, we heard an overwhelming demand for a web-based system to better engage parents. Teachers felt that finding a way to communicate with parents—who are often not available for regular, in-person interaction—would be very useful.

Overall, the lack of buy-in may have been a self-perpetuating problem, as teachers reported that they did not look back at their own posts to see if anyone had responded, eliminating the potential for discussion and exchange. This may be one reason why the blogging and collaboration aspects of Connect were not used.

Technical Challenges

While the first phase of our study of ARIS suggested that technology problems were not a major barrier to using the ARIS Data areas (Gold et al. 2012), the educators we talked with about ARIS Connect presented a different picture. They described various technical challenges that impeded their ability to use Connect. While some of these obstacles may have been overcome through more training, some aspects of the ARIS Connect user experience seem inherently problematic.

- Connect’s Interface Is Difficult to Learn and to Use

Educators complained that before uploading a document, they had to check off many boxes and list items. These extra steps discouraged educators from contributing to Connect’s searchable library. When teachers did try to contribute, the quantity of

filter options was frustrating and counterproductive. As one teacher explained, “When you’re uploading data, it’s almost too specific, so I think people are kind of turned off of clicking everything.” As a result, the educator continued, “when you do a search it’s just not as valid.” In general, they found the site “clicky,” difficult to navigate (requiring educators to visit multiple pages to find the information they wanted), and not “user-friendly.” Ironically, while one of the goals of ARIS Connect was to improve efficiency, many educators reported that it was simply too time-consuming to be helpful.

- Useful Resources Are Hard to Find on Connect

Administrators and teachers reported a variety of problems when looking for materials in Connect’s resource library. The first problem they identified was in navigating the Connect site and finding the right information, as described above.

Teachers also reported two types of problems with search results. First, they often received limited results. As one teacher described, “You don’t always get an abundance of resources with the search in Connect....That’s been an issue for me over the years...pulling it up and being limited to one or two things.” Limited results could be a product either of a poorly programmed search function, or of an absence of relevant resources (resulting from limited use of Connect).

On the other hand, at times Connect returns too many results. As one educator told us, “When you [enter a] search title, a million resources come up that are related or unrelated...most are irrelevant.” Sometimes this was due to a lack of differentiation between content *about* your search term and content that incidentally *mentions* your search term. An assistant principal provided an example:

As an example of that, say you put in the word “bullying”...it comes up as a resource but [it’s just] an agenda that mentions the word “bullying”...so to put it simply, I don’t think it’s an intelligent search. It just searches.

In both cases, educators told us that the results they found through searching were often not helpful. Connect does not have a screening process for educator-posted resources. As a result, users found resources of varying quality mixed together, making it difficult and time-consuming to locate useful materials. In addition, as we described above, teachers were often frustrated by Connect’s overcomplicated filter

process when uploading resources, which may have contributed to inaccurate labeling of resources.

What Other Online Collaboration Tools Did Educators Use?

Despite the challenges with Connect, our research uncovered that educators do have an appetite for Ed-Tech tools in general, and Web 2.0 tools specifically. Our interviews included probes about what tools educators were using in addition to, or instead of, ARIS Connect. Educators cited different online tools that have similar features, such as resource sharing, but that they saw as easier to navigate and more user-friendly. One teacher explained, “I don’t really feel a need to use [ARIS Connect]...because I can get everything else through different means.”

We found that rather than using one multipurpose tool, educators reported using several tools, each tailored to a specific need. These include tools for communication with students, file sharing, and resource libraries.

Figure 3: What Types of Web 2.0 Tools Do Educators Use Instead of ARIS Connect?

Communicating with Students	Sharing Documents	Finding Resources
<ul style="list-style-type: none"> • Popular Functions <ul style="list-style-type: none"> • Posting assignments and grades • Sharing lesson plans • Popular Tools <ul style="list-style-type: none"> • Edmodo • Engrade • Skedula 	<ul style="list-style-type: none"> • Popular Functions <ul style="list-style-type: none"> • Sharing curriculum materials, school calendars, exams • Track changes made by other users • Popular Tools <ul style="list-style-type: none"> • Dropbox • Google Drive (Google Docs) 	<ul style="list-style-type: none"> • Popular Functions <ul style="list-style-type: none"> • Search for curriculum resources, especially for Common Core-aligned materials • Popular Tools <ul style="list-style-type: none"> • EngageNY (NYSED) • Common Core Library (NYC DOE)

- Communication with Students

The assignment and gradebook tools used the most were Skedula, Edmodo, and Engrade. These tools provide multiple ways of communicating with students, including posting assignments and grades and sharing resources, such as lesson plans and videos for students. One teacher described using Edmodo:

Yesterday I put a cool video of computer coding, which has a lot to do with math but I couldn't show that in class because I need to do test prep and all this other stuff, so I put it in Edmodo...and they can watch it and it's an extension of the classroom.

Educators cited several advantages to these tools, including hosting real-time data (e.g., grades from classroom tests), and being user-friendly.

- File Sharing

Google Drive, specifically Google Documents (“Google Docs”), and Dropbox, were the most popular tools that teachers and administrators used to post documents and share resources with both teachers and students. These are easily accessible, organized platforms for sharing materials, such as curriculum resources, common planning materials, unit exams, student assignments, Inquiry materials, and school calendars. Teachers indicated that the ability to view a document’s revision history was a key feature in their use of Google Docs.

While educators can use ARIS Connect to post documents and share resources, as we saw above, they found the interface inflexible, indirect, and difficult to use.

- Resource Libraries

Teachers provided a long list of websites they use to find lesson plans, sample activities, and other planning resources. Importantly, in Spring 2013, new Common Core–aligned assessments were administered in New York State for the first time. Teachers preparing for these tests during the 2012–2013 school year were especially eager to find information and resources to help prepare their students, such as sample tests, questions, tasks, and activities. Given that all teachers were equally inexperienced in preparing for the Common Core, it is not surprising that teachers and school administrators sought out extra resources in this area. Indeed, we found that the two most popular resource libraries were related to the implementation of the Common Core: EngageNY (developed by the New York State Education Department) and the Common Core Library (developed by the NYC DOE). Educators also cited a host of other resource-sharing websites.

Again, resource sharing was one of the primary purposes of ARIS Connect, but educators reported that it was easier to find the resources they needed through other sources.

Summary and Conclusion

Our research suggests a disconnect between the DOE's objectives for ARIS Connect and how educators actually perceived and used the tool. Connect was meant to facilitate the Inquiry cycle and foster a culture of collaboration among educators. By providing a space for resource sharing and discussion, Connect was intended to spark innovation and save time. In general, these goals were not met.

Overall use of ARIS Connect was low, accounting for just 20 percent of all time spent on ARIS. Our interviews and focus groups suggested that Connect was used primarily by school Inquiry teams, who mostly did so out of a sense of obligation. To a lesser extent, educators described using Connect to post or retrieve resources, although technical frustrations limited the usefulness of this function.

The majority of teachers who were not Inquiry team members did not use Connect on a regular basis or at all. Educators who we interviewed or who participated in our focus groups cited a long list of problems preventing them from using ARIS Connect—including not knowing that it existed. Among the other problems cited were a lack of training about the purpose of Connect or how to use it and difficulty finding helpful materials. Some of the tools in Connect, such as the blogs and wikis, did not seem useful to teachers, many of whom preferred to use other tools for the same purpose and some of whom preferred face-to-face communication.

Our discussions with teachers revealed that many of them are using other Ed-Tech tools in an effort to improve their classroom instruction. The most popular technologies being used by educators are (1) tools for communicating with students; (2) file-sharing products; and (3) online resource libraries. Some of these features are unavailable through Connect. And in the case of features that *are* in Connect, many educators still preferred to use outside products.

Our analysis of educator use of ARIS Connect and other online collaboration and resource-sharing tools suggests several important lessons about the development and release of Ed-Tech tools:

- **Involve educators in the development process.** Our findings showed that some teachers did not feel a need for the blog, wiki, or discussion areas of ARIS Connect. In fact, these features were directly antithetical to some teachers' preference for face-to-face collaboration. However, educators have discovered

many existing online tools that they do find useful and can imagine others that they don't yet have. Including educators in the development process could have prevented the misalignment between ARIS's goals and educators' needs, both by enabling more accurate responses to specific needs (e.g., tools to communicate with parents), and also by taking into account school culture (e.g., a preference for face-to-face communication).

- **Avoid redundant products.** Some components of ARIS Connect were already available to teachers at little or no cost through existing products, such as Google Drive and Dropbox for sharing documents. ARIS Connect even seemed to compete with other tools developed by the DOE, such as the Common Core Library, another online resource library. School districts should focus on areas where affordable, effective tools don't already exist, and should avoid developing two competing products.
- **Provide training and professional development.** Teachers often feel ill-equipped to use Ed-Tech tools, partly due to a lack of professional development (Buckenmeyer 2008; Ehrlich et al. 2011). In general, online communities succeed only with a critical mass of participants, particularly when first established (Raban et al. 2010). When districts invest heavily in developing and implementing new technologies, it is crucial that schools invest in related training and support—and that they are provided sufficient resources to do so—to ensure that the new technologies can be used as intended. Educators need to learn not only the basics of using the tool, but also its goals and specific ways that it can simplify and improve their work. Tools designed to facilitate collaboration and innovation are particularly unlikely to succeed without the buy-in of the intended users.
- **Take advantage of a unique position.** When developing new online tools, the NYC DOE and other school districts should use resources they have that are unavailable to the private sector. For example, school districts could consider offering a tool that helps teachers decide among existing education technology products, instead of adding to the sea of existing Ed-Tech tools. A reviewing tool developed by an impartial source that represents educators (rather than a technology developer with financial interests) could be a powerful way to help educators make the most of a growing market. Another example might be a link that facilitates communication between educators and parents, as we heard many

teachers call for through our fieldwork. These are just two examples of the types of online tools that the NYC DOE and other districts may be in a position to develop more effectively than the private sector.

Many of these recommendations seem intuitive. However, ARIS, NYC's first district-wide data and instructional platform, brought both the DOE and NYC educators into uncharted territory. Our findings about ARIS—presented in this brief and our 2012 report on ARIS usage—provide strong evidence that it was difficult to translate some of these common-sense insights into practice when developing and rolling out ARIS. More recently, new DOE Ed-Tech development efforts, such as the iZone and Innovate NYC Ecosystem, do appear to be making an attempt to incorporate educator perspectives in the development process, and are more explicitly focused on cultivating educator buy-in.

The Research Alliance is continuing to investigate data use in classrooms. The final component of our ARIS study will provide a quantitative analysis of whether ARIS use was associated with improvements on student achievement. We are also collaborating with a team of New York University researchers to conduct an in-depth study of a group of high-poverty schools that exhibit above-average data use. By investigating the characteristics and practices of these schools, the role that data plays in instruction, and teacher attitudes about using data for instructional purposes, we hope to continue learning about which tools educators find helpful, and to what effect.

We hope that this brief and our ongoing studies prove useful to the NYC DOE, New York State Education Department, and other districts, as they continue to gain experience and refine the process for developing district-wide Ed-Tech tools.

Endnotes

¹ Our study included only the ARIS Data and Connect components.

² See Gold et al. (2012) for full clickstream data analysis methodology.

³ This was true when we looked at *all* educators, and also when we looked only at educators who actually used Connect. Among educators who used Connect at least once in 2011–2012, administrators logged about 45 minutes per user, whereas teachers logged only about 22 minutes per user.

⁴ As described in the textbox on page 5, we did not ask principals to recruit teachers who did or did not use Connect frequently for the focus groups, and we did not specifically ask for Inquiry team members. However, it is possible that principals deliberately selected

teachers for our focus group that used ARIS Connect in their role on an Inquiry team.

⁵ We selected our sample based on average Connect usage in the 2010–2011 school year. However, ARIS usage in all schools went down between 2010–2011 and 2011–2012, which may, in part, explain why, even in our high-usage ARIS schools, some teachers were not familiar with Connect.

⁶ Carroll defines knowledge management as “organizational policies, practices, and tools that allow individuals to better understand and to help define the bigger picture of which their work is a part, and to more easily benefit from and contribute to the work of others in the organization.” (Carroll et al. 2003).

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