

An abstract graphic on a green background. It features several thick, colored lines (white, orange, green, and purple) that start from the bottom left and move upwards, turning right and then up again, resembling a circuit board or data paths. At the top, there are three circles: a light green one on the left, a white one in the middle, and a dark purple one on the right. Below the white circle is a white arrow pointing up. Below the orange circle is an orange arrow pointing up. Below the purple circle is a dark purple arrow pointing up. The main title is in large white font, and the subtitle is in a smaller dark purple font. A large green arrow points from the right side of the subtitle area towards the left.

# Data- Informed Decision Making

A Guide to Institutional  
Research in  
Independent Schools

**CIR**  
**IS**

Center for Institutional Research  
in Independent Schools

# Foreword

When I moved into my role at Maret School in 2017, I was not the first independent school institutional researcher and was clearly not the best one (nor would I even attempt to claim that title today!) What I did have was curiosity about the work and about how other people were approaching it. When I started reaching out to strangers at other schools for help and advice, I assumed my pleas would be politely ignored – independent school faculty and staff are not known for having vast swaths of leisure time to spend replying to electronic cold calls or for sharing tactical insights with other schools.

In every way, reality defied my expectations. Everywhere I turned, I found people who were excited, passionate, brilliant, kind, hilarious, and emphatically generous with their time and knowledge. The other commonality we all seemed to share was the feeling of working in isolation at our institutions. So often an “office” of one, each of us at our own little computer spread across the country, screaming at our data sets (in either rage or celebration, depending on the moment), inventing our own version of the wheel, doing our best to love and care for our students, colleagues, and communities through the languages of statistics and spreadsheets.

In those early days of the “network” (i.e. group email) that would evolve into CIRIS, there was a palpable sense of relief and joy in “finding our people,” swapping war stories, and supporting each other. The knowledge, wisdom, camaraderie, and enthusiasm the institutional research community has shared with me over the last several years, particularly through the depths of the pandemic, have truly been some of the most joyous highlights of my career.

So this Guide is truly a letter of love and gratitude from CIRIS to all of you who have and will continue to join us as we explore and shape the as-yet untamed frontier that is institutional research in independent schools. While it is impossible to name every individual who has helped create or pave the way for this Guide, there are a few that merit special recognition.

- CIRIS is funded by an E.E. Ford Educational Leadership grant, allowing this Guide (and all CIRIS programming) to be provided to the community free of charge. So, first and foremost, I have to thank the leadership team and Board of Maret School and John Gulla of the E.E.

Ford Foundation for believing in the idea of CIRIS, for help in writing the grant proposal, for awarding the grant, and for raising matching funds from the Maret community. This Guidebook and its linked resources would be neither accessible nor pleasantly legible without the help of María Lopez, Carolyn Law, and Zaw Lyn, who have worked tirelessly to teach me about everything from website maintenance to font and color styling.

- This Guidebook is truly the distilled wisdom of everyone who has participated in CIRIS programming over the last five years, especially members of the first four CIRIS Summer Fellows Lab cohorts. In particular, it was an honor and privilege to lead the 2023 cohort who co-authored the Guide. They worked tirelessly to listen to and empathize with the broader IR community, to compile resources and advice, to proofread and critique a ponderous pile of ramblings down to the (relatively) concise and insightful oeuvre you now peruse. Each of them is truly a beacon in our community, and I am forever grateful for their generosity.
- CIRIS has been the beneficiary of the support of a number of associations as we have prepared the Guide. I'd like to thank Heather Hoerle and Christina Dotchin at the Enrollment Management Association, Amada Torres and Hilary LaMonte from the National Association of Independent Schools, and Dr. Erin Rehel from OneSchoolhouse for supporting the Guide and helping to distribute the inaugural Institutional Research State of the Industry Survey. We hope this Guidebook is a springboard to more collaboration in the future!
- From almost the first minutes of its existence, CIRIS has benefited from unwavering support from Christina Lewellen, Kelsea Watson, and Dr. Ashley Cross at the Association of Technology Leaders in Independent Schools (ATLIS.) CIRIS is a fledgling organization, and the ATLIS team has truly taken us under their wing, providing opportunities to collaborate on PD webinars, giving sound advice on the foundations of association work, and even giving the annual CIRIS Summit a home within their own annual conference. Thank you for being such a pillar of support for me personally and for the IR community (and for being so fun!)

Though we present it as a finished product, this Guide is neither perfect nor complete. We anticipate that readers may disagree with certain points or feel that there are glaring omissions; indeed, the authoring cohort itself

was not always of one mind on every single topic, and we shed a few tears when shearing away some sections for the sake of brevity. Nevertheless, we hope it will prove to be both a useful, practical resource for school leaders and institutional researchers as well as a touchstone that brings our community together for further discussion as we continue to co-build the future of this field.

And we look forward to writing the second edition of this Guide in a couple years once AI has rendered most of its contents obsolete! 🙃

Last, but certainly not least, we'd like to thank you, intrepid reader, for opening this Guidebook and diving in with us! We hope you enjoy it.

With Gratitude,

Eric Heilman

Editor-in-Chief, *Data-Informed Decision Making: A Guide to Institutional Research in Independent Schools*

Executive Director, Center for Institutional Research in Independent Schools

# About the Guide

*Data-Informed Decision Making: A Guide to Institutional Research in Independent Schools* was written by the 2023 [CIRIS Summer Fellows Lab](#) cohort. Through a series of CIRIS Data Culture webinars and sessions at the 2023 CIRIS Summit, cohort members gathered information and assessed the needs of school leaders and data analysts looking to start an institutional research program. This Guide is the result of this collaboration.

With gratitude to the E.E. Ford Foundation and the Maret community, this Guide is presented as a free resource for the independent school community. We hope readers will share and use the Guide freely with proper attribution. This Guide should not be bought or sold, and if you encounter a vendor or entity that is charging any fee for it, please contact us at [eheilman@maret.org](mailto:eheilman@maret.org).

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**Note:** While the authors feel that curling up with the Guide by a cozy fire and reading it from start to finish would be a lovely plan for a weekend, we know that this may not be feasible for many readers. We've attempted to create relatively self-contained chapters rich in reference tables and distilled bullet points so that readers can quickly and easily find practical information. Feel free to jump around as your needs arise.

The first four chapters of this Guide are intended to address “big picture” issues in institutional research and are useful for Heads of School, board members, and school leaders in general as well as institutional researchers themselves. The second half of the Guide explores practical topics that institutional researchers commonly grapple with in the course of actually executing data analysis work.



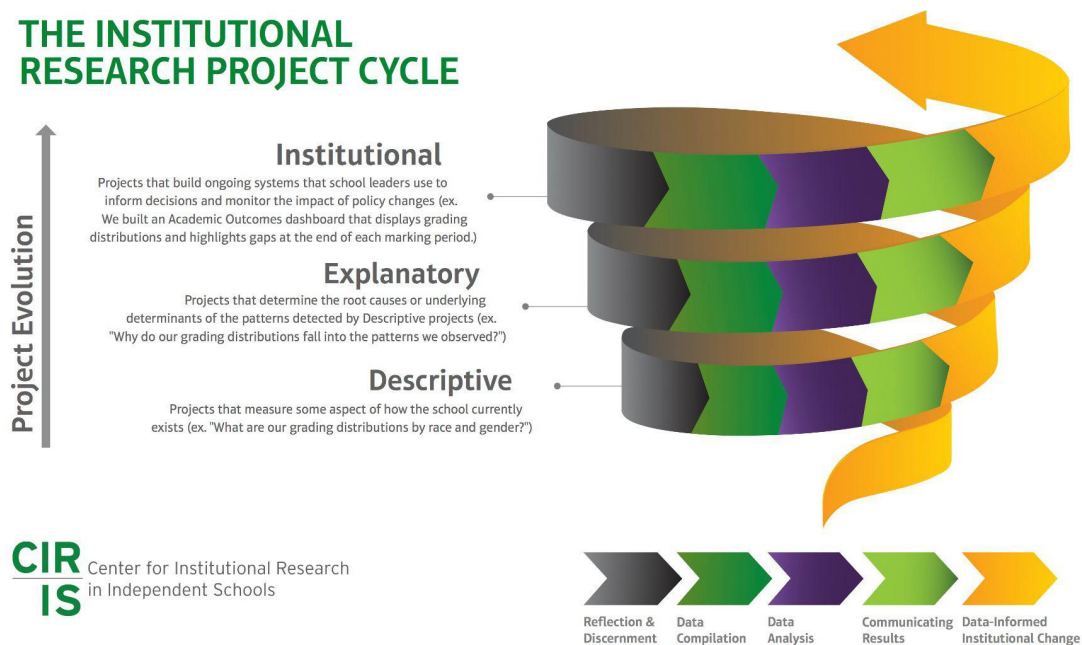
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# Introduction

## What is Institutional Research in Independent Schools?

Broadly speaking, CIRIS defines institutional research (IR) as the work of using quantitative and qualitative data to describe and analyze school processes for the purposes of improving decision making. What this looks like on the ground in different schools varies widely depending on institutional priorities, staffing structure, and maturity of the IR program. Generally, while topic areas vary, schools cycle through three types of institutional research projects: descriptive work, explanatory work, and institutional level work.

### THE INSTITUTIONAL RESEARCH PROJECT CYCLE



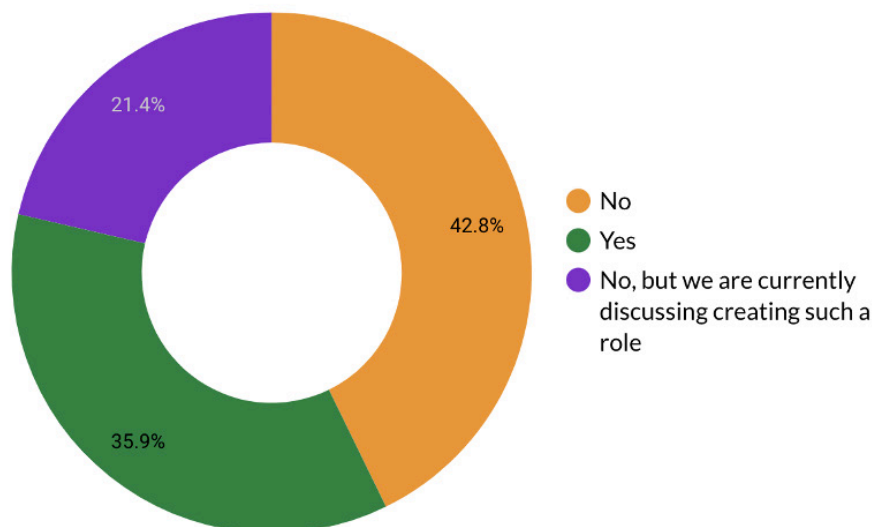
**CIRIS** Center for Institutional Research  
in Independent Schools

[Chapter 2](#) is largely dedicated to giving examples of these types of projects, but it is safe to say that almost every school is already engaged in basic descriptive IR. Most schools include statistics about the school community in admission outreach (e.g. "X% of our student body identifies as a person of color," "Y% of our faculty hold an advanced degree," "Our student:teacher ratio is A:B," or "Z% of our graduates go on to four-year colleges.") We also include many examples of descriptive IR in board

reports, accreditation self-studies, and in annual reporting to external organizations like the National Association of Independent Schools (NAIS). Congratulations! You've already begun your IR journey!

While independent schools have a long history of this kind of task-oriented data compilation, it is only recently that they have started creating staff positions explicitly dedicated to leveraging school data across functional areas to glean operational insights. Over the last ten years, a number of the most popular independent school database vendors have incorporated functionalities that have increased the exportability and interoperability of major school data sets, setting the stage for the wave of data analysis and institutional research we see today.

“Does your school currently have any staff responsible for data analysis and/or institutional research beyond required external reporting to outside organizations (e.g. DASL data for NAIS)? Please consider full/part time employees regardless of whether they hold an officially named position.”



About 57% of schools responding to the [2023 CIRIS Institutional Research State of the Industry Survey \(IR SOTI\)](#) ([statistical disclaimer](#)) reported that they either already have or are in discussions to create a position dedicated to IR or data analysis. Schools with more than 500 students that were robustly meeting their enrollment targets were slightly more likely to report having or discussing an IR program; these correlations were not particularly strong, and we

A number of CIRIS members contributed to [this excellent article](#) from [Explo Elevate in 2021](#). It touches on many of the topics raised in this chapter, and we highly recommend it for further reading.

see an increasing interest in leveraging data from all types of independent schools across the country.

## The Value of Institutional Research

Schools pursue institutional research for a variety of reasons. Aside from the tactical insights data analysis can yield, the process of executing IR also has a number of benefits for the community:

- Investing resources (time, expertise, money) in institutional research work has the potential to bring greater clarity and transparency to when, why, and how decisions are made.
- While independent schools largely excel at building relationships with individual students, families, and faculty/staff, they often rely on anecdotes and/or personal experiences fraught with unconscious bias when thinking about the community in aggregate. Institutional research provides a source of information or counter-narratives that can complement our understanding of what's going on in our schools.
- Institutional research allows colleagues to learn and understand more about the institution in which they work and encourages colleagues to engage in the intentional practice of continuous improvement.
- Much of the work done in institutional research requires collaboration, communication, and curiosity within and across school divisions and departments. This helps to de-silo departments and provides colleagues with greater understanding of how the institution works as a symbiotic whole.
- Considering that schools are already collecting, storing, and (hopefully) maintaining an abundance of data, there exist easy and natural entry points for institutional research that can provide insights and will require little in terms of initial resources (time, expertise, money).

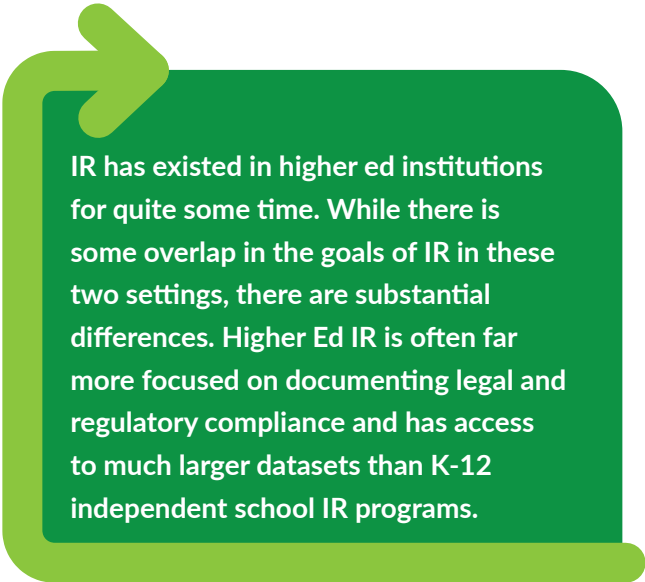
***Data helps inform schools of the challenges and opportunities that might not be readily apparent and truly informs the decisions they make. While all schools must follow their missions, data-informed decisions within that breadth help schools continue to evolve and thrive in ways that meet their context.***

– DEBRA WILSON,  
PRESIDENT, NATIONAL ASSOCIATION  
OF INDEPENDENT SCHOOLS

# Institutional Research Core Competencies

In order to execute quality work, institutional researchers ideally need to bring a diverse skill set to bear. It is extremely rare to find individuals in the independent school world who have deep experience in all of these areas, but we offer them as an aspirational outline and roadmap for skills institutional researchers should focus on developing as they grow. For schools looking to move someone into an IR role, the most important goal should be to identify candidates who have strengths in the subset of areas below that complement your school's current strengths.

- Institutional Knowledge:** Excellent institutional researchers understand the school's mission and culture. They are familiar with both formal decision-making processes and the informal relational topography of the school. They understand how the various functional elements of the school work together, and they are familiar with different constituencies in the school community. They are especially attuned to issues of equity and access as much of their work is often focused on these areas. In addition to understanding the inner workings of their own school, institutional researchers also stay abreast of trends happening in the broader independent school community and understand how their school fits into this broader context. They also stay abreast of trends in education research, including qualitative and quantitative methods, which often are gleaned from work at the college/university level, international education, and the public education system in the U.S.
- Data Architecture:** Excellent institutional researchers have knowledge of how and where data is stored at a school. Researchers know what information the school already has, how to most efficiently build and manage new databases, and how to unite data from multiple sources to construct usable data sets. They should understand a school's data governance practices, how databases are structured, and how to execute queries of those databases.



IR has existed in higher ed institutions for quite some time. While there is some overlap in the goals of IR in these two settings, there are substantial differences. Higher Ed IR is often far more focused on documenting legal and regulatory compliance and has access to much larger datasets than K-12 independent school IR programs.

- **Data Analysis:** Excellent institutional researchers have a strong background in statistics and quantitative analysis. They are fluent in concepts like sampling and survey design, hypothesis testing, linear and non-linear regression analysis, machine learning algorithms, qualitative research and analysis methods and the difference between correlation and causation. To execute these techniques, they need to be adept with data analysis software like Excel, Google Sheets, R, Qualtrics, SQL, SAS, STATA, Python, Google Looker Studio, Power BI, or Tableau.
- **Data Visualization and Communication:** Excellent institutional researchers create graphs, tables, and other data visualizations and explanations that make their work clear and understandable to a wide variety of audiences. Additionally, they are keenly aware of and proactively address the emotional impact and/or skepticism that project results can elicit in a school community.
- **Data Culture Development:** Excellent institutional research is both the catalyst and product of a healthy Data Culture in a school. Given the symbiotic relationship between research projects and institutional goals, an institutional researcher needs to understand how the details of their projects work in harmony with other programs (e.g., in executing demographic analyses, an institutional researcher must understand how crucial it is to allow constituents to identify themselves authentically.) In a thriving Data Culture, faculty and staff grow their individual level of data literacy, they trust each other enough to invite unbiased assessment of their work, and they are secure enough to accept feedback about what is or is not working as believed within the community. In a healthy Data Culture, institutional research projects have an observable impact on systems and decision-making in the school. Institutions with a healthy Data Culture have the collective will to change and evolve.

Again, it is extraordinarily rare to find people with a strong background in all of these areas. If a school currently has or finds such a person, it would be wise to hire and retain them! It is far more common to find candidates for IR roles that have a strong background in a subset of these areas. Before deciding on a position structure or looking to fill a role, schools should consider where their institutional strengths and deficiencies currently are in these areas and seek to structure and hire for a role that complements their current needs.

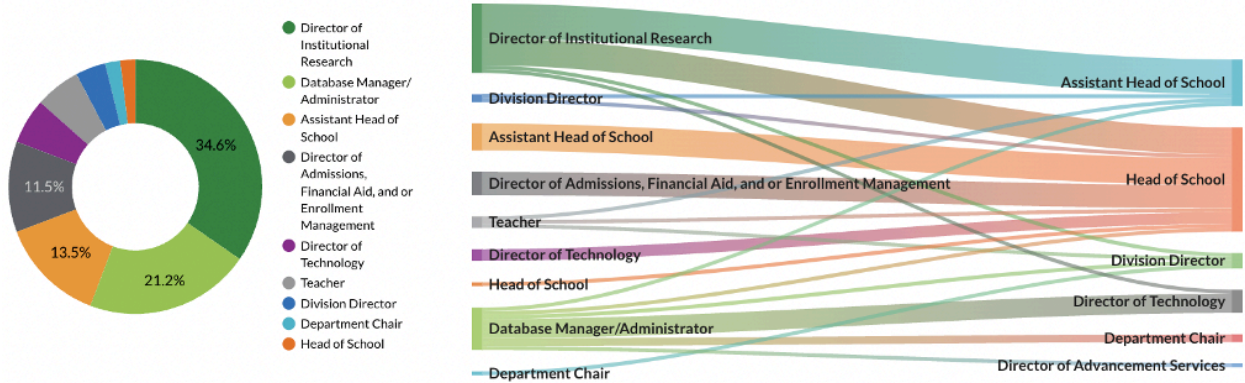
# The Structure of Institutional Research Roles

One of the first questions schools tackle after deciding to pursue an IR program is how the role or program should be structured and staffed. The visualizations below show [IR SOTI](#) results from current institutional researchers about their job titles and reporting structure.

**For schools that currently have an IR/data analysis role:**

“Which of the following most closely matches your current role/title at your school?”

Position Title	Direct Supervisor
----------------	-------------------



About this visualization: Sankey diagrams show the intensity of connection between interrelated phenomena. In this case, the nodes on the left represent the position titles of the data analysts who responded to the survey while the nodes on the right represent the position titles of their direct supervisors. The width of the nodes and ribbons represent the number of observations following that path. The wider a node or ribbon is, the more common it was. For example, 18 respondents reported that they hold the title of "Director of Institutional Research," nine of whom report to an Assistant Head of School and seven of whom report to their Head of School. Heads of School (the widest node), represent the most common supervisor of all responding data analysts.

The most common structures we see in schools are:

- A part-time Director of Institutional Research role reporting to an Assistant Head of School or directly to the Head of School. This also includes “institutional researcher” positions that are not (yet) at the Director level.
- A position inside of the Technology Office reporting to the Director of IT. Position titles often include “Database Administrator” or “Data Analyst.”
- An Assistant Head of School reporting to the Head of School. People in these roles (commonly named “Assistant Head of School for Strategic Initiatives”) are commonly charged with overseeing IR work at the school as part of their broader role, which is often focused on overseeing

initiatives linked directly to a strategic plan. If they are actually executing the IR work themselves, it tends to be a smaller portion of their job responsibilities. More frequently, they partner with a small team of other personnel to accomplish the work.

There is no “right” or “wrong” way to organize institutional research, and each option has its own advantages and disadvantages, outlined in the table below.

Type	Pros	Cons	Sample Position Description link	Avg. Annual Salary	Avg. FTE % spent on IR
Director of Institutional Research	<ul style="list-style-type: none"> <li>Has bandwidth to execute job</li> <li>Can combine expertise with functional knowledge from other offices/ roles</li> </ul>	<ul style="list-style-type: none"> <li>Most substantial up front investment as it typically requires starting a new position.</li> <li>While this will likely change quickly, may not be enough work to sustain a half time position initially</li> </ul>	<a href="#">Dir. of IR Sample 1</a> <a href="#">Dir. of IR Sample 2</a> <a href="#">Institutional Researcher (non-Director)</a>	\$119,055.56	51.67
Database Manager/ Administrator	<ul style="list-style-type: none"> <li>Typically has a strong background in database architecture and data extraction/ cleaning</li> <li>Cost effective entry into IR</li> </ul>	<ul style="list-style-type: none"> <li>Can be too many layers away from leadership and may lack the institutional clout needed to advance the work</li> <li>May have limited knowledge of the lived experience of other school functional areas</li> </ul>	<a href="#">Dir. of IR within the Tech Department</a>	\$83,428.57	27.73
Assistant Head of School	<ul style="list-style-type: none"> <li>Has the positional clout to both initiate projects and incorporate results into operational decision-making</li> <li>Typically has strong knowledge of school operations in many areas</li> </ul>	<ul style="list-style-type: none"> <li>Unlikely to have bandwidth to personally execute IR work given other responsibilities.</li> <li>Might need a partner with technical or statistical expertise</li> <li>Relatively expensive first step into IR</li> </ul>	<a href="#">Sample Asst Head of Strategic Initiatives</a>	\$137,000	26.86



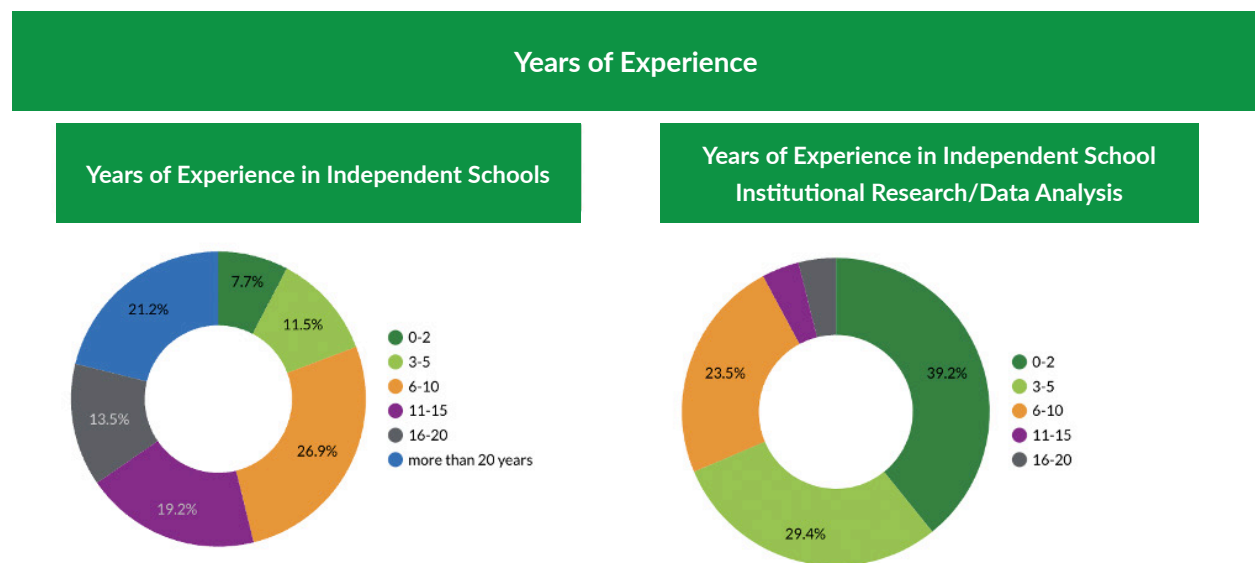
There are a few commonalities across role structures that every school should consider beyond reporting structure and salary:

- Full-time positions dedicated to institutional research are still rare in independent schools. No matter where they sit in the school, data analysts are very likely to wear another hat (or two or six...) in addition to their role as institutional researcher. School leaders should not assume that starting an IR function requires a new full time position; in fact many schools that currently have strong IR programs began with a smaller, part-time role with a plan to ladder up the FTE percentage as the volume and complexity of the work grew over a multi-year horizon.
- CIRIS posits that including a Director of IR on your senior leadership team in some capacity is beneficial for both the leadership team and the institutional researcher. A Director of IR who is working with offices across campus, reading and summarizing a variety of constituent feedback, and paying close attention to internal metrics can offer a unique perspective to team meetings. Merely being in these meetings also benefits the Director of IR because it allows them to hear what the operational concerns and priorities are and helps them maintain an accurate sense of the team's data literacy levels, which, in turn, helps them produce useful and accessible analysis.
- Even if your IR role is outside of the Technology Office, starting an IR function will almost always create new demands on at least one person in the Tech Office. At minimum, the Tech Office will need to spend some time ensuring that the institutional researcher has access to all of the requisite data sources. Institutional researchers often work closely with tech personnel around [data governance, storage, and extraction](#).
- While schools may have a single person spearheading initiatives, IR is by nature a collaborative process that “takes a village.” Oftentimes, the institutional researcher works with a standing committee of colleagues with complementary expertise to coordinate the diverse needs of an IR program.
- The long term success of an IR program depends just as much on the broader community's commitment to developing a strong [Data Culture](#) as it does on the structure of the role and expertise of the person doing the work. If school leaders do not have a plan in place for both how they will incorporate new data results into actual operational decision making

and how they will grow the community's data literacy, the IR program will wither, no matter where it is situated organizationally.

## Thoughts on Staffing IR Roles

Many schools are currently creating and filling their inaugural institutional research positions and may not have the historical frame of reference for evaluating hiring criteria that they have for more established positions. Whether looking at internal or external candidates, we offer some insights from the [IR SOTI](#) about the characteristics of people already in these roles.



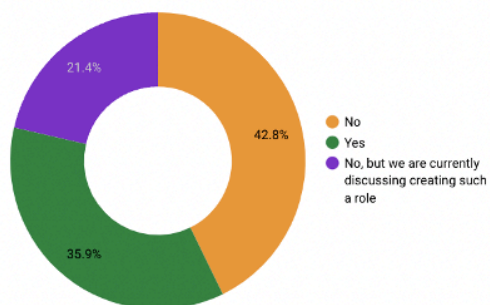
- Institutional researchers tend to be relatively new to this particular role but typically have deep experience in independent schools more generally.

Most IR SOTI respondents who are currently in an IR role have been working in independent schools for more than 10 years but have been in an IR role for five years or less. When hiring, keep in mind that qualified candidates may not have an extensive history in these roles specifically. Because of the relative novelty of the position in general, it is crucial to focus on finding candidates who demonstrate evidence of the [IR Core Competencies](#) that complement your institutional needs rather than years of experience in a similar role alone.

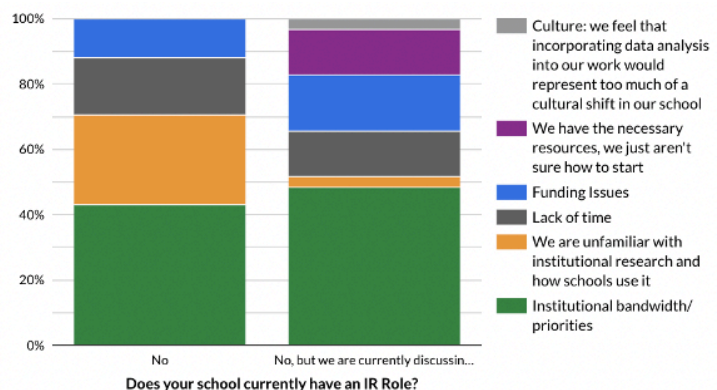
- Staff responsible for hiring for these roles may not, themselves, have a background in all of the IR Core Competencies. Consider assembling a hiring team with members who can effectively gauge candidate strength in each area. It is also common for hiring schools to reach out to other schools that have an established IR role for help with crafting position descriptions.
- Strong candidates for these roles often have many job options both inside the independent school world as well as in private industry. In order to hire and retain experienced institutional researchers, they should be prepared to fund a salary and benefits package that keeps this in mind.
- On the other hand, schools that are just starting an IR program likely do not need a PhD-credentialed researcher with decades of experience. Candidates with less experience but strengths in some of the IR Core Competencies are often less expensive to staff while also being fully capable of the types of projects young IR programs often take on. At this stage in the independent school sector, great institutional researchers are much more likely to be grown than found.
- Many new institutional researchers require comprehensive onboarding when starting at a new school. They have to learn the school's data systems, build relationships with other staff, and absorb the culture of the school. Schools should build in time for these important activities and should temper their expectations of IR output, especially at the start of a program.

### Perceived Obstacles to and Next Steps for Starting an IR Role

Does your school currently have any staff responsible for data analysis and/or institutional research beyond required external reporting to outside organizations?



Which of the following do you feel has been the biggest obstacle in further exploring the creation of an IR/data analysis role at your school?



# The Road (and Obstacles) to Institutional Research

The figures below show intended next steps for schools hoping to start IR programs as well as the most commonly reported obstacles to moving forward.

- Most schools that are looking to start an IR function intend to develop the role as a part time responsibility within a larger job or combination of jobs.
- Funding issues are not the primary obstacles to starting an IR program. The vast majority of IR SOTI respondents listed bandwidth/time constraints or lack of familiarity with the benefits of and first steps to starting an IR program as their foremost obstacles. CIRIS hopes this guide and ongoing professional development offerings can help alleviate the latter.

To ameliorate time and bandwidth constraints, a substantial number of schools are also looking to outsource specific IR projects as an initial step to building a program. While the remainder of this guide will focus on providing resources for growing an internal IR program, outsourcing (via consultants or contractors) can make a lot of sense as an intermediate step in that process, especially in a few specific circumstances:

- A school might need to execute a project on a contentious topic for which it is useful to bring in an objective party without a perceived agenda to perform analysis (e.g. a cost-benefit analysis of eliminating an existing program or position(s) and reinvesting resources elsewhere.)
- The school needs technical analysis on which legal obligations may hinge (e.g. analyzing fire risk to model future insurance premiums.)
- A school needs a standalone project to be completed by a specific deadline and will use the process to build data literacy in the community (e.g. an analysis of grades needs to be completed ahead of a DEIB strategic planning process.)
- A school hires consultants who will partner with an internal member of the school staff to co-complete the project thus obtaining results in a timely manner while simultaneously building the school's capacity to complete future projects on their own (e.g. IR Coaching engagements or co-building dashboards for ongoing operational use.)

Institutional research consulting is available from a number of national firms. Results from the IR SOTI also indicate that current independent school institutional researchers are interested in and able to take on contracting work for other schools. The new [IR Exchange](#) is designed to help schools in need of data analysis expertise to connect with experienced institutional researchers.

## Readiness for Institutional Research

While we believe that institutional research can provide powerful insights and value to independent schools, not all schools are ready for an IR program (yet!). As detailed in the [Data Culture chapter](#), IR programs can only thrive in communities where people are open to new perspectives and are willing to change. Before setting out to start an IR program, we strongly suggest that school leaders make an honest [assessment of their current Data Culture](#).

## Conclusion

In the 1990s and early 2000s, independent schools had to learn how to best organize and manage new roles and systems generated by the rise of the internet. While independent schools certainly lag behind the private sector, it is clear from the rise of Big Data and AI, that we are moving into a similar period where schools again need to organize and manage new roles and systems generated by advances in data infrastructure and analysis. Institutional research provides a way forward in these areas, can provide new operational efficiencies, and can help schools from becoming blinded by anecdotes and outdated narratives about community experiences.

At CIRIS, we believe that in the near future, institutional research and data analysis roles will be just as common in independent schools as Director of Technology positions, and we hope that the resources provided here can help guide your school as we navigate these new waters together.

***Today we need to not only improve data collections to better understand our school challenges and opportunities, we must also commit to institutional research to ensure that OUR SCHOOL lives its mission fully. The role of the growing community of institutional researchers and CIRIS in the wider community of independent schools is fast becoming essential.***

– HEATHER HOERLE,  
EXECUTIVE DIRECTOR AND CEO,  
THE ENROLLMENT MANAGEMENT  
ASSOCIATION

**Statistical Disclaimer:** As good statisticians, we want to acknowledge some of the limitations of the IR SOTI data. While the sample includes a wide variety of schools in terms of size and location, the total number of responding schools was just 145 with just over 50 of those schools having an IR role. Of those, only about half reported salary information. Additionally, while the survey was distributed by a number of national associations including [CIRIS](#), the Association of Tech Leaders in Independent Schools ([ATLIS](#)), the Enrollment Management Association ([EMA](#)), [One Schoolhouse](#), and the National Association of Independent Schools ([NAIS](#)), we have to note that the schools who self-selected into responding are probably more aware of institutional research than the average independent school. We suspect that the estimates about the prevalence of IR programs exhibit some upwards bias. We offer the information simply because it is nearly impossible to find elsewhere, but we encourage readers to interpret the information as a rough guideline and upper bound on what is happening in the wider independent school community. CIRIS hopes that people will find this information useful and will be excited to respond to the next IR SOTI! ([Go back](#))

# Institutional Research in Action

## Consider the following (perhaps familiar) scenarios:

*The class deans at Data Academy need to track student attendance in order to enforce the class attendance policy which dictates whether or not students receive course credit. Unfortunately, the only way they can currently check on this is to click on each student individually in the SIS to see how many absences they have. It's tedious and annoying to do, so the attendance policy is inconsistently enforced, if at all.*

*The Admission Office at Data Academy has been hosting outreach programs at specific locations around their market but wonder if these locations maximize their reach. They currently have no way to visualize their application data to show patterns.*

*In faculty meetings discussing student performance and diversity, equity, inclusion, and belonging work (DEIB), teachers implicitly and explicitly assert beliefs about achievement gaps at the school based on their personal experiences with their own classes and students. Without an overarching view of achievement patterns examined by grade level, discipline, and/or demographics, policies are driven by anecdotes that may or may not address the needs of the entire student body.*

Scenarios similar to the ones above are commonplace in independent schools, and institutional research is able to address each of them. Broadly speaking, institutional research projects in independent schools fall into four categories: Process Simplification, Descriptive projects, Explanatory projects, and Institutional projects. In the examples below, we have outlined the four types of projects and offered examples of institutional research projects in each one. The links in the table below

will take you to functional (but fictionalized) interactive dashboards on the CIRIS website that you can explore.

Type	Description	Value add	Examples
Process Simplification	These projects make access to existing data and metrics easier.	Reduces demands on personnel bandwidth. Saves time, reduces frustration, makes it easier to be proactive	<ul style="list-style-type: none"> <li>• <a href="#">Attendance tracker for Deans to monitor student class absences</a></li> <li>• Student achievement monitoring to inform advisors/deans of grades-to-date so that interventions can be implemented</li> <li>• Student support/accommodation tracking for Learning Support Office</li> <li>• Real time, auto-updating admission spaces available based on re-enrollment</li> <li>• Dashboard for College Counseling consolidating course enrollment, grades, standardized test scores, club engagement, athletic and arts activities, and awards into one student profile</li> <li>• SAT/PSAT score processing and reporting from College Board</li> </ul>
Descriptive Projects	These projects use data to explore and discover patterns that exist within the community.	An understanding of what is happening at the school that is independent of anecdotes and gut feelings	<ul style="list-style-type: none"> <li>• <a href="#">Grade analysis dashboard to show grading patterns across demographics and disciplines</a></li> <li>• <a href="#">Dashboards to highlight Admission activity across demographic and geographic markers over time</a></li> <li>• Rubric analysis to identify bias in admissions processes</li> <li>• Analysis of high school math course enrollment patterns relative to math placement in middle school</li> <li>• Help desk ticket evaluation for resource and staffing evaluation</li> <li>• Collecting and reporting survey data for teacher and staff evaluations disaggregated across various demographics</li> </ul>



Type	Description	Value add	Examples
Explanatory Projects	These projects seek to understand why the patterns uncovered in descriptive projects exist and how the school might intervene to change them.	Allow for an objective understanding of the real drivers that are common across constituency groups	<ul style="list-style-type: none"> <li>Identifying and explaining correlations between student engagement and academic success.</li> <li>Explaining student “rigor ratings” in the college admissions process in terms of course placement/advising.</li> <li>Modeling academic success in terms of admissions testing scores.</li> <li>Comparing observed AP performance and scores expected based on PSAT scores</li> <li>Conducting focus groups or interviews for qualitative analysis</li> </ul>
Institutional Projects	These projects are of strategic value to the school and touch on multiple functional areas. They often involve designing new metrics and incorporating new data flows to support those metrics.	Measure progress towards long-term strategic goals and/or measure goals that do not have traditional metrics	<ul style="list-style-type: none"> <li>Assessing growth in DEIB</li> <li><a href="#">Measuring holistic student engagement or Wellness</a></li> <li>Measuring environmental sustainability goals</li> <li>Measuring the development of core competencies by students</li> <li>Strategic plan accountability tracking</li> <li>Creating automated, high-level dashboards for the Board of Trustees to complement or partially replace traditional Board reports</li> </ul>

Projects within each type can vary in how difficult they are to execute. Difficulty of execution often depends on factors like the number and cleanliness of the data sources involved and the level of statistical analysis required.

## Institutional Research Project Topics by Operational Area

Actionable data exists in nearly every area of the school. The tables below list common research questions in the areas of Academics, Admissions, Learning Support, and DEIB, but similar questions exist for functional areas like:

- Advancement, Development, and Fundraising
- Alumni relations

- College Counseling
- Business Office, Operations; Financial Analysis
- [Constituent Surveys](#) (parent satisfaction, for example)

## ACADEMIC LEADERSHIP

- In what ways do our course enrollments support or refute proportional representation of students by sex, race, and/or socioeconomic status?
- How do we measure and interpret student longitudinal growth and/or where do we see grading “inconsistencies” within and across academic disciplines?
- What are faculty staffing needs for a given school year?
- What types of professional development experience are most effective for faculty and why?
- How can we create a more inclusive school community?
- In what ways does our school define success/thriving?
- How do we measure and track student well-being and mental health as it intersects with school life?
- Who receives disciplinary warnings and for what reasons?

*In my career I have found that a healthy institutional research function is critical to the success of our schools. The challenges we face are many and overcoming them requires data-driven decision making at the highest levels.*

— CHRISTIAN DONOVAN,  
HEAD OF SCHOOL, FRIENDS SCHOOL  
OF BALTIMORE

## ADMISSION

- How do we track activity in our market over time? How can we identify potential emerging and maturing catchment areas?
- What are ways to extend and improve the use of traditional metrics and trends to guide strategies and action?
- How do we measure and assess internal consistencies with the applicant file reading and selection process?
- What are possible indicators of potential success or fit for admission candidates? Which pieces of information gathered in the admission process are actually correlated with thriving at our school?

## LEARNING SUPPORT, STUDENT ENGAGEMENT

- In what ways can we identify the need for academic interventions that will best support our students?
- How can we observe, track, and promote the consistent use of learning accommodations?
- In what ways does the academic experience of students with learning support plans differ from other students?
- To what extent is a student engaged in school via attendance, classroom participation, clubs and activities involvement, athletics, leadership opportunities, etc.?
- What programmatic changes will best support student well-being while simultaneously challenging and supporting students in an appropriate manner?
- How can student growth be tracked over time through testing and other metrics? In particular, if and when a student receives academic intervention, how are the outcomes of that intervention assessed?

## DIVERSITY, EQUITY, INCLUSION, AND BELONGING

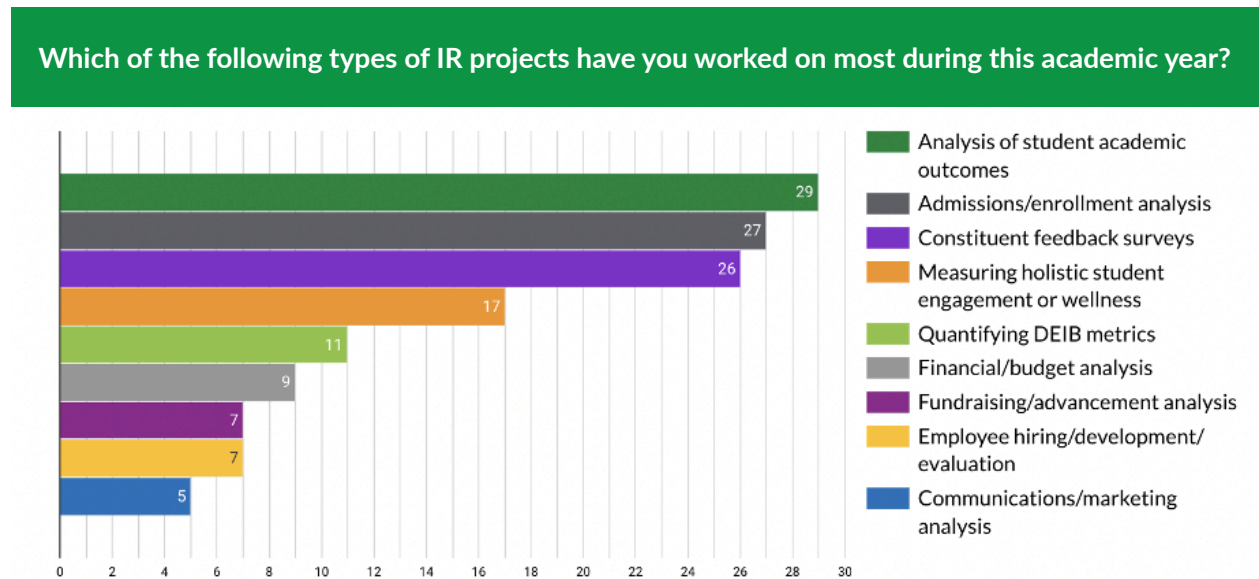
- In what ways can we identify factors that improve or hinder students' sense of belonging and inclusivity within the school community?
- How equitable is the access to and distribution of student resources and opportunities across the school?
- To what extent are the academic and social experiences of students from diverse backgrounds the same or different?
- How do recruitment and retention practices help to create a diverse faculty?

Please visit the [CIRIS IR Project Catalogue](#), which gives a searchable list of IR projects executed at schools around the country in a variety of areas. Listings include information about requisite skills and platforms as well as ease/difficulty of execution.

## Where to Start

With such a variety of applications, it’s natural to wonder, “Where do we start with IR?” The large majority of IR programs begin with process simplification or descriptive projects (often, an individual in the school community who is already executing process simplification projects is tapped to step into an IR role because of their ability to manage data.) Because process simplification projects make people’s lives easier and descriptive projects often substantiate the strengths of a school, institutional researchers sometimes refer to these undertakings as “winning hearts and minds” projects that help launch an IR program in a positive way.

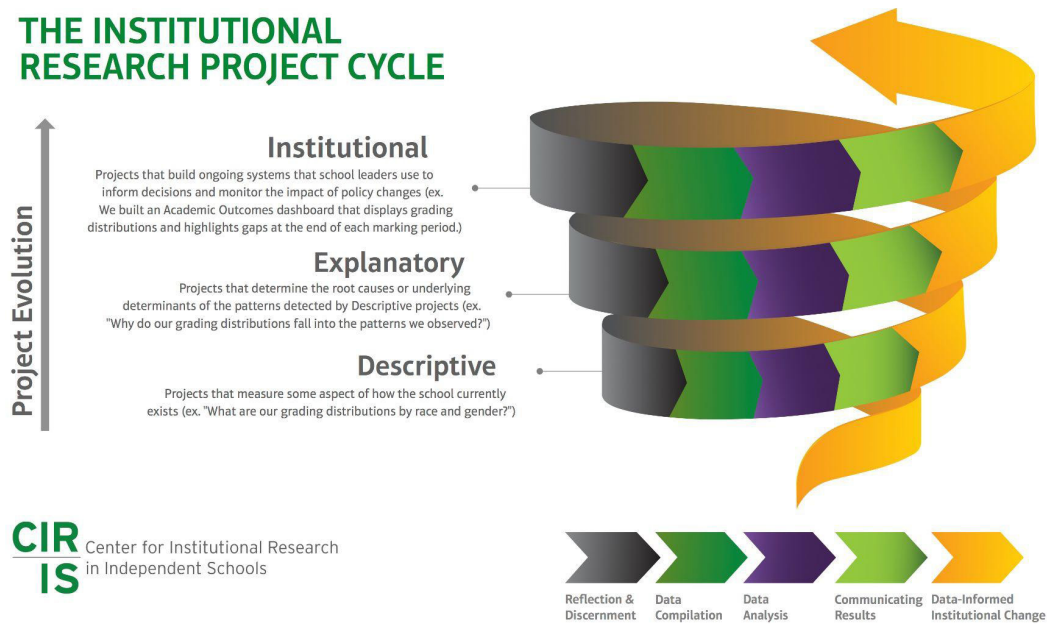
The graph below, from the [2023 CIRIS IR State of the Industry Survey](#), shows the most common topic areas for projects from respondents who already have an IR program.



Schools often begin with academic or admission projects because, in many cases, the requisite data sets are available directly from a database, have been consistently maintained for a number of years, and are comprised of relatively clean data.

# How Institutional Research Programs Evolve

One fundamental dynamic of research is that “projects beget more projects.” At CIRIS, we often think about individual projects as a link in an evolution of inquiry similar to design thinking paradigms. We call this iterative process the “IR Project Cycle.”



A concrete example of the journey through this cycle can be found in Maret School’s IR program:

- Maret began their IR program with a standalone analysis of grades by race and gender over a 15 year period. This project blended descriptive and explanatory elements, and concluded that students from demographic groups R and S had higher average grades than students in groups X and Y.
- This standalone project focused on historical grades then evolved into an ongoing institutional Grade Analysis Dashboard that school leaders could use to track whether these gaps were growing or shrinking each semester.
- A few years later, Maret launched an ongoing system of alumni surveys focused on young alums. Feedback from these surveys revealed a seemingly contradictory result: the demographic groups with the lowest

average grades tended to give the most positive feedback about their overall experience at the school.

- This paradox led to a deeper look at the implicit and explicit ways faculty defined student success and thriving, which eventually led to the development of Maret’s Thrive Model, a system that seeks to measure student engagement in six holistic, mission-aligned areas of school life.

## Conclusion

While institutional research programs all share a common foundation in data analysis, the exact form and focus of the program varies widely from school to school. In some schools, institutional researchers only work on strategic projects for their Head of School or Board. In others, they work closely with individual teachers. Some institutional researchers focus heavily on constituent feedback surveys. Where you choose to focus first will depend on your school’s strategic priorities and on the culture across various offices in your school, especially around data and institutional change.

# Data Culture

## Consider the following (perhaps familiar) scenarios:

*Your school regularly surveys students, parents/guardians, and alumni. Every time you ask your head of school to start regular surveys of faculty, he refuses, saying “Trust me...I already hear all of their complaints.”*

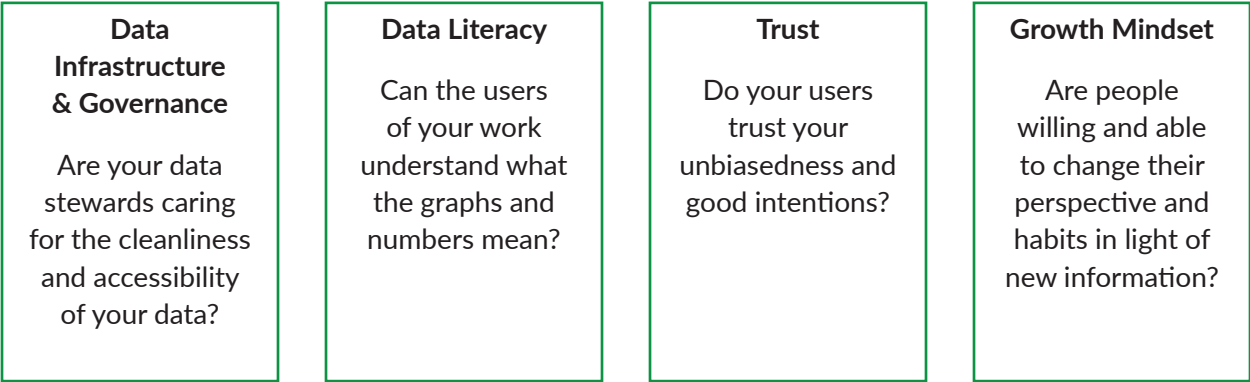
*Through a very sophisticated statistical technique, the institutional researcher at Data Academy demonstrates that up to 40% of the difference in average grades between different student racial groups is due to placement policies and inconsistencies in how teachers grade across different curricular tracks. School leadership is skeptical of the finding and chooses not to address the issue because of the friction it would cause with faculty and the report is never discussed again.*

Every aspect of an independent school is shaped by culture. Institutional research and analysis is no different, and a school’s Data Culture directly influences the efficacy of its data use. While school values, norms, and attitudes shape work with data, an intentional approach to Data Culture creates a climate in which the work can be most impactful.

## What is Data Culture?

At CIRIS, we define Data Culture as a school community’s feelings and actions towards the collection, storage, analysis, interpretation, and response to data. A school’s Data Culture rests on four interrelated pillars:

# Pillars of Data Culture



## DATA INFRASTRUCTURE & GOVERNANCE

Data is the lifeblood of institutional research and Data Culture. Being intentional and careful about how data is collected and stored is so foundational to Data Culture that we've dedicated an [entire chapter](#) to it.

## DATA LITERACY

A school's Data Culture can only thrive if members of the school community (faculty, staff, students, parents/guardians, alums) can read and understand analytical results. Not everyone in the community needs the same level of data literacy; clearly the institutional researcher should aim to have the highest level of data literacy but schools should not feel that they need to train everyone in the community to be research statisticians. Instead, schools need to identify the skills different constituencies need to successfully interpret the dashboards or reports they are expected to interact with routinely. For example, if course evaluation feedback for teachers shows averages and uses boxplots, then all teachers need training on interpreting averages and reading boxplots. Since school leaders typically access a broader range of metrics and visualizations, they will likely need additional data literacy training.

Identifying the data literacy needs of different community members, establishing training protocols for existing and new personnel, and updating those protocols as your Data Culture evolves are the primary goals for a data literacy program and would ideally fall under the purview of the school's [Data Strategy committee](#).



## TRUST

A culture of trust is important whether a school has an institutional research program or not. It is, however, a central feature of Data Culture specifically. A school’s Data Culture thrives best when community members feel safe both giving and receiving balanced, reliable, valid, and unbiased feedback. Constituents must believe that others in the community have their best interests at heart. A climate of trust can develop when schools have open, safe discussions around data collection, access to data, and regular uses of data. Presentations sharing early successes, challenges, and findings can mitigate pushback. However, most schools should anticipate some level of pushback.

Much like we do with our students, educators can encourage a sense of adult curiosity and inquiry around data. Some guidelines schools can use to cultivate the spirit of inquiry and foster trust are below:

- Maintaining a clear and accessible [Data Governance](#) policy for incoming data so the community trusts the integrity and privacy of source data used in projects as well as the ethics surrounding how data is used.
- Acknowledgement across the school that data is an institutional asset and not the property of any particular office or person. Establishing clear policies for data sharing between offices and institutional researchers. Once a project has been approved, [Data Stewards and Custodians](#) should not have the option to refuse to release data. Ideally, Data Stewards and Custodians would be part of the project selection process via a Data Strategy committee so they trust the intentions of the project.
- Similarly, projects should not be carried out “in secret.” If the institutional researcher is working on a project about the college application process, for example, the College Counseling Office should know that the project is happening and what its aims are. When offices only learn about projects once results are being reported, it feels like an ambush that erodes trust, even if the results are positive.
- Schools can unintentionally convey distrust in members of their community by hoarding project results out of fear that the results will make them or the school “look bad,” that their community members will “take the results out of context” and take it upon themselves to “do their own research,” or simply because they can’t find the time to discuss the best way to share the results. If the source data

for a project was a survey, some form of results should **always** be shared back with the constituency that filled out the survey. If you don't loop back to them to share what you heard from them, they will not trust that their time and input are valued and response rates will decline. It's important to remember that any criticism revealed through data analysis already exists whether you share the results or not – failing to acknowledge the criticisms instead of getting ahead of the situation by recognizing them and expressing a plan to address them will undermine the efficacy of your IR program and increase the frustrations that exist in the community already.

What does it look like for a school to effectively communicate and share the results of a research project? The diagram below shows how one school processed and communicated the results of a student climate survey:



The full presentation is available [here](#).

- When communicating results to stakeholders, institutional researchers should be willing to explain their methodology in any level of detail so that the audience trusts the process the institutional researcher went through.
- Institutional researchers should be meticulous about presenting balanced results. Oftentimes, schools take their strengths for granted and want to jump directly to weaknesses to address. This tendency

sends the implicit message to the community that data is only critical, which will increase [pushback and skepticism](#). Institutional researchers should always present positive results alongside critical ones so that the community perceives them as objective (and because people deserve to be recognized for good work!). School leaders should amplify positive results back to the community to show that data analysis gives evidence of the great work happening at the school.

- It is common for institutional researchers to move into this role after having been at a school for a long time. As such, they can be perceived to have biases against or favoring certain offices or staff. The institutional researcher's direct supervisor should have frank discussions with the researcher about their biases (we all have them!) and how to check them. Similarly, school leaders should be mindful of how personal feelings staff have towards the institutional researcher may hamper their willingness to accept valid analytical results (see section below on [Data Skepticism](#).)

## Growth Mindset

Are people willing and able to change their perspective and habits in light of new information? To foster a healthy data culture, faculty and staff need to have a growth mindset and to be open to actually making changes based on what they've learned. All members of a school community can contribute in the ways outlined below.

- Whenever possible, institutional researchers and school leaders should model their belief that they have both strengths and weaknesses and want to use data to celebrate their strengths and work on their weaknesses. For example, if an institutional researcher is showing the faculty how to read the course evaluation results dashboard, they could use their own actual course evaluation results in the demo and discuss both the mechanics of the dashboard as well as how they glean both positive and critical takeaways in what they see. In sharing results of a faculty climate survey, a Head of School can publicly discuss what they took away as strengths and action items.
- Change is not universally popular. If a school implements a change that 95% of the community supports, there's still 5% who might be vocally upset about it. Change also doesn't happen overnight. It might take

several years for the benefits of change to be evident. School leaders need to be prepared to weather pushback during a transition period and resist the urge to reverse themselves.

- Data analysis should inform both additive and subtractive change. There's a tendency to add new programs or responsibilities in response to data analysis. While this is appropriate, it should also be balanced. Analysis also does a great job of highlighting practices that *aren't* working and should be cut. For example, if your Admission surveys consistently show that the school's presence at fairs has almost no impact on Admission decisions, stop requiring your staff to go to them, especially if the analysis is also pointing to more fruitful new practices. Releasing practices that aren't working is just as much a part of a growth mindset as taking on new ones.

## Data Skepticism and Pushback

Data skepticism and pushback are major concerns when cultures start embarking on strategic data use, and for good reason. In the moment of communication, pushback can be overwhelming and discouraging, and just the fear of it can put a halt to good data work. It's important to understand that this is a natural part of the development of Data Culture.

Before moving on in this section, we need to be clear about what constitutes "Data Skepticism." Almost every school will have some members of the community that are "early adopters" of data usage and some that just refuse to engage. Even enthusiastic early adopters will have clarifying questions about project results or even push back on methodology. This is fantastic and welcomed; institutional researchers are not infallible, and it is important for their work to face scrutiny and double checking.

There is a difference, however, between good faith clarifications and Data Skepticism, which is a blanket hostility or passivity towards data in general. Data Skeptics often view themselves as acting in good faith. One way to distinguish between good faith questioning and Data

***Education does not stand still, and we owe it to students, faculty/staff, and families to understand much more deeply the quantitative and qualitative value our institutions provide in the present. Our schools also have a professional and moral responsibility to identify, early, when initiatives, curricula, etc., are not providing the outcomes we anticipated.***

— RACHEL SKIFFER,  
HEAD OF SCHOOL,  
HEAD-ROYCE SCHOOL

Skepticism is that Data Skeptics tend to raise issues only when results are critical. Good faith questioners will raise concerns about methodology whether the results in question are positive or critical. The comments in the remainder of this section are meant to address Data Skepticism.

To mitigate the growing pains of skepticism and pushback, it helps to anticipate what they look like, where they come from, and to strategize about how to bring skeptics into the conversation so as to feel prepared when they appear. The table below offers some common manifestations, root causes, and solutions to specific forms of Data Skepticism.

Root Cause	Example Manifestation(s)	Solutions
<p>Low Data Literacy: A misunderstanding of statistical concepts and research methods</p>	<ul style="list-style-type: none"> <li>A teacher claims that their course evaluation average results for 50 students are low because of “one disgruntled student.”</li> <li>A division director asks what the response rate was (40%) and then publicly questions the validity of the results because “such a small group of parents responded” and “for all we know, some people replied multiple times.”</li> </ul>	<ul style="list-style-type: none"> <li>Determine minimum levels of data literacy for various roles at the school. Be intentional about providing systematic training to both existing and new faculty/staff to reach requisite levels.</li> </ul>
<p>Workload Concerns: Ignoring or minimizing analytical results because people fear having to do additional work to adequately respond</p>	<ul style="list-style-type: none"> <li>A grade analysis definitively reveals that a substantial portion of the gap in average grades across racial groups is due to placement and grading practices that are currently at the discretion of individual faculty. The analysis is shelved.</li> </ul>	<ul style="list-style-type: none"> <li>Data projects should be catalysts for both adding and deleting current practices. Many schools fall into a pattern of only adding responsibilities to respond to feedback. Data projects should also be deployed to simplify existing projects and to prune practices that are not effective.</li> </ul>
<p>Fear of Criticism: School faculty and staff are passionate and invested in their work. They often assume data is only used to highlight weaknesses. They are preemptively defensive.</p>	<ul style="list-style-type: none"> <li>Specific offices around campus refuse to collect or share data about their functional area.</li> <li>Feedback at the school is unidirectional; faculty and staff do not have opportunities to share feedback about those in leadership but are expected to respond to feedback about themselves.</li> </ul>	<ul style="list-style-type: none"> <li>Never present only negative feedback. Data reports should <i>*always*</i> include both strengths and weaknesses!</li> <li>Be clear on institutional goals ahead of time, and don’t “move the goal post” after results are in</li> <li>School leaders can publicly model how they receive both positive and critical feedback about themselves to demonstrate healthy growth.</li> </ul>

Root Cause	Example Manifestation(s)	Solutions
<p>Fear of Invalidation</p> <p>Data analysis focuses on finding broad patterns or trends that happen on average. The individuals in our communities, however, do not experience the school “on average.” When the broad trends conflict with individual experience, people can feel that data is “erasing” or invalidating their lived experience</p>	<ul style="list-style-type: none"> <li>• A grade dean declines to check in on a student whom data indicates might be struggling because they don’t believe statistics can capture the nuance of the relationships they build with students</li> <li>• A division director refuses to engage in any data projects because they believe that the process of teaching and learning in their division is too nuanced and personalized to be described quantitatively</li> </ul>	<ul style="list-style-type: none"> <li>• If building a Data Culture is a goal the institution has set, the Head of School must make it clear that disengaging from data entirely is not an option.</li> <li>• Openly acknowledge that average results don’t always match individual experience</li> <li>• Help the community understand that statistics can indeed model complex human interactions. If AI algorithms can use data to accurately anticipate our shopping or entertainment preferences, data can also be used to model complex processes like teaching and learning.</li> <li>• Resolve conflicts between data and lived experience by avoiding either/ or thinking. Oftentimes, situations that present a paradox between lived experience and data results are entryways into the most interesting follow up inquiry. In many cases, both points of view are accurate in different ways.</li> </ul>

## Managing Skepticism and Pushback

An overarching strategy for managing pushback is to shift skepticism and conflict into curiosity and inquiry. The following tips can help make that change, even in the moment.

- Talk about Data Skepticism with your team and community before you undertake any projects. Many schools have done excellent work around recognizing and having protocols in place to address microaggressions. Similar work around Data Skepticism can help your team recognize when colleagues (or they themselves!) are exhibiting skepticism.
- Be clear about the intent and goals of your institutional research program. It is important to note that people might be nervous about the “stakes” IR work. If the data does not show what the school is hoping to be true, they might wonder if their job or salary will be in danger or if their department’s budget might be reduced (a heightened form of Fear of Criticism.) For this reason, data can be met with defensiveness. Remind your team that data isn’t meant to “catch” anyone doing

something wrong; it's just there to help us understand what is going on around us and solve problems more efficiently.

- Give people space to feel conflicted about the findings. Even data enthusiasts may have an emotional reaction to results.
- Accept criticism when it's accurate and make a plan to address it.
- Listen and gently explain when criticism is unfounded. Consider the root cause of the skepticism and have a few "scripts" prepared to address different causes.
- Model an inquiry orientation by asking questions and showing curiosity when conflicts and criticisms arise.

It's important to note that these strategies should be employed broadly throughout the leadership team. While an institutional researcher themselves should certainly model these practices, depending on where they sit in the organization, they may not have the positional authority to implement them widely and will need support from school leadership.

## Data Culture Precursors

While CIRIS believes that institutional research can have a positive impact in any school, it's important to gauge your school's Data Culture before leaping into an institutional research program. We have found that school cultures that exhibit the following traits are often ready to start building Data Culture through an IR program:

- There is a positive culture and intentionality around professional development in all parts of the school. This includes a healthy relationship with feedback. There are official feedback practices in place (or a genuine desire to have them) that flow in all directions; teachers receive feedback from students, parents/guardians, and supervisors. Teachers also have the opportunity to provide feedback about their supervisors and school leadership.
- There's a general feeling of trust between community constituencies. Community members feel that decisions are made transparently and with good intentions, even if they don't necessarily agree with the outcome. They also feel they have appropriate voice in decisions.

- Community members feel empowered to try new things without an overly burdensome approval process. Similarly, trying a new initiative is viewed as a valuable learning experience even if its results are mixed or even negative. A desire to do things differently is not perceived as a criticism of the school or its leadership; it is instead viewed as a sign of wanting to help the school more effectively deliver its mission and is valued.
- There's a real desire to authentically live the mission of the school. The mission drives operational choices and is not just a slogan on the website. This desire is evidenced by serious attention to community criticism based on the mission rather than dismissiveness or reflexive defensiveness.

Before starting an IR program, we'd encourage any school to complete a Data Maturity Assessment (DMA) instrument to get a baseline understanding of where your school stands with respect to the four pillars of Data Culture. The [CIRIS DMA](#) is one option that can serve as both an assessment and roadmap for growing your Data Culture. We'd also recommend repeating your chosen assessment at regular intervals to gauge institutional progress over time.

## The Evolution of Data Culture

Now that we have covered what Data Culture is and how to foster it (perhaps ad nauseum!), we close the chapter with a rough overview of the stages of Data Culture development and its typical evolution:

- School leadership completes a Data Maturity Assessment and/or gauges whether their community exhibits the precursors to Data Culture listed above. If the precursors are not evident, they work on developing them before launching an IR program.
- At the outset of a new IR program, the school is focused on setting up systems like a [Data Strategy Committee](#) and working to audit, map, and update their data infrastructure and governance.
- Early IR projects focus on winning the hearts and minds of the community through process simplification projects and projects that are likely to give evidence of institutional strengths. This is also a great time to work collaboratively on projects with the data enthusiasts/early adopters in your community.



- The school begins data literacy training for all constituents and proactively addresses topics like Data Skepticism. It may also be helpful to establish protocols for discussing data at this point to give faculty and staff scaffolding to enter these conversations. This is especially helpful for supervisors who will need to discuss data feedback with direct reports who may not themselves feel comfortable with data. Examples of data discussion protocols from the School Reform Initiative can be found [here](#), [here](#), [here](#), and [here](#). We also recommend the book *Got Data? Now What?* by Lipton and Wellman.
- Once the school feels like it has a good handle on data infrastructure and governance, the institutional researcher moves into descriptive projects. Good starter projects in this area are based on established, well-maintained, and easy to access data sources. Examples might include a grade analysis dashboard or an enrollment management dashboard. This is also a great time to establish constituent feedback programs (e.g. course evaluations, parent/guardian surveys, alumni surveys, etc.) Even if these systems already exist, the school should reassess whether the results they get are valuable, accessible, and actually inform policy. If not, it's time for a revamp!
- By now (typically around year three of an IR program), the community has made progress in data literacy and has bought into the usefulness of projects to date. In fact, in many schools, once the community sees what IR is capable of producing and has seen the results of descriptive projects, their appetite has been whetted and they begin posing questions about why certain patterns exist. This is a sign that the institutional researcher should move into explanatory projects and can start adding more complex visualizations or analyses to existing reports.
- Once the Data Culture has matured, schools can begin the process of identifying and collecting data to inform progress toward harder-to-measure elements of the school's mission. For example, one of the challenges independent schools face is gauging how well they are achieving "squishier" aspects of the school mission like wellness or equity, inclusion, and belonging. While many of the more traditional and concrete school metrics (course grades, GPA, test scores, college placement) provide an easier entry point into quantifiable aspects of the mission statement (academic rigor, for example), there is growing interest in observing features of the mission that are more nuanced and challenging to measure.

- At this point, the school has identified mission-aligned metrics and targets. They regularly monitor their progress in these dimensions and results inform policy decisions.

## Conclusion

A school's Data Culture is at least as important as the skill of its individual institutional researcher in determining the long run success of an IR program (perhaps even moreso.) While an institutional researcher may have all of the requisite skills to produce insightful analysis, the program will wither if the broader school community can't understand or refuses to engage with project results. School leadership should recognize that while the institutional researcher certainly has a role in fostering Data Culture, it is not a task they can complete alone and they will need support. The suggestions and tools laid out in this chapter can help a school community intentionally grow their Data Culture to build an environment in which institutional research can flourish.

## Further Reading and Resources:

[The Data Culture Project](#)

[Data Culture Project Case Studies](#)

[Learning Analytics Collaborative - A Guide for Building Cultures of Data Use](#)

[Mandinach, E.B., & Gummer, E.S. \(eds.\). \(2021\). The ethical use of data in education: Promoting responsible policies and practices. Teachers College Press.](#)

[Navigating the Landscape of Data Literacy: It IS Complex](#)

[Feldon, D.F., Callan, G., Stephanie, J., & Jeong, S. \(2019\) Cognitive load as a motivational cost. \*Educational Psychology Review\* 31\(2\). 319-337.](#)

[Data-Informed Leadership in Education](#)

[Toolkit for a workshop on building a culture of data use](#)

[A Practical Framework For Building A Data-Driven District Or School](#)

[The Data Management Toolkit - Irina Steenbeek](#)

# Tips for Heads, Boards, Associations, and Vendors

At this point, CIRIS hopes two central themes have emerged: 1) institutional research is an emerging field with schools adopting a wide array of models to do the work and 2) creating an environment where IR can thrive is complex and needs support from stakeholders across a school community. In this chapter, we offer suggestions and requests for those in the independent school community who we often turn to for advice and guidance on how to navigate complex transitions.

## For Heads of School

Through the official policies they enact and through their words and actions, Heads of School can often make or break the long run success of an institutional research initiative. We offer the following suggestions for helping an IR program thrive.

- Approach data with an open mindset. Be aware of the natural tendency to reflexively doubt information that elicits negative feelings, as well as the biases that you and others in your community may hold.
- Assess your school's current Data Maturity status. There are a number of assessment instruments available (e.g. [Project Unicorn](#)) for this purpose. CIRIS offers [our version](#) here to use as is or as a starting point for your own.
- Using your mission statement and/or strategic plan as a guide, assess whether you currently have metrics in place for your strategic priorities.
- Work with your Director of Technology and database administrators to focus on data architecture and governance to support not just task completion but also insight development. Your team should work to ensure that data in different systems is interoperable, that data collection conventions stay constant even when a position turns over, and that you maintain access to historical data even if you change systems.

- Consider establishing a [Data Strategy Committee](#) that will create and oversee a holistic plan that identifies high-value data, determines how to collect, maintain, store, and analyze that data, articulates how that analysis will be communicated to stakeholders, and addresses community-wide data literacy and institutional change dynamics.
- Model and expect data literacy and awareness from your team. Ask, “How do we know that?” early and often. Demonstrate your own familiarity with your school’s most recent data feedback by referring to it in discussions or presentations. Anecdotes and lived experience have an important role in running a school, but we believe there must be a balance between beliefs and data in decision making.
- Plan to support your current faculty and staff in growing their data literacy and responsiveness. It is not a straightforward learning curve for everyone, and making sure everyone on staff has role-appropriate data literacy skills will need to be part of the onboarding process for new hires.
- Be aware of and have protocols in place to respond to common forms of [Data Skepticism](#).
- Resist the urge to restrict access to results. While we always want to take steps to protect anonymity, it’s important to remember that the audience of a data feedback system is not just the internal leadership team. Institutional research is a communal exercise happening between your team and your various constituent groups. To sustain a thriving Data Culture in the long run, it is vital to engage the constituencies that generate the data by sharing back with them what you’ve heard.
- Relatedly, explain how your team uses data to inform policy decisions and use data proactively. When you get positive feedback about some aspect of your community, congratulate the people producing those results. When you get critical feedback, tell your constituents, “We hear that you wish X were better in our school. Let’s talk more about how to address it together.”

*Effective schools are learning organizations, and one of the most critical ways to learn is to conduct institutional research. Achieving a deep understanding of your own school allows you opportunities not only to correct deficiencies but to maximize opportunities for growth and better reach your full potential.*

– T.J. LOCKE, ED.D.,  
THE GREVILLE HASLAM HEAD OF  
SCHOOL, THE EPISCOPAL ACADEMY

# For Board Chairs and Members

Boards play a crucial role in stewarding a school’s mission, setting strategic priorities, and securing resources necessary for the school’s leadership team to execute those priorities. Helping an institution pivot from a task-oriented Data Culture to an insight-oriented Data Culture needs both strategic leadership and material resources.

- Consider prioritizing your school’s [Data Strategy](#) by incorporating it into your next strategic plan and allocating adequate resources to support it. At right is an example of the strategic plan language at Maret that led to the launch of its IR program, and [here is an example](#) of an Action Plan around “Data Driven Decisions,” written by the International School of Panama in response to a strategic plan goal.
- The board committee that works with the school’s tech department can engage tech leadership in a discussion around data interoperability and governance. Find out what resources the office needs in order to position the school’s data infrastructure to be able to leverage data across systems for insights rather than just task completion.
- Talk with your Head of School about the high-level, strategic metrics the Board would like to track and then establish protocols for existing and incoming board members to get appropriate data literacy training. While many board members come from a quantitative background, not all do. Board members who do come from quantitative backgrounds in other settings may be used to having access to operational metrics that would be too “in the weeds” for a school board member, so while they may not need data literacy support, they may need an orientation to your school’s Data Culture.

**Measurement and Evaluation**

Successful change requires careful, honest, and fact-based assessment of our progress, our failures, and our accomplishments.

- We evaluate our curriculum to keep pace with changing societal demands, current research on education, and evidence-based teaching techniques.
- We examine our program critically to ensure it will develop talents, well-adjusted learners who are prepared to succeed in the world they will inherit. This includes reviewing student data for any disparities in academic achievement among ground with different social identifiers.
- We see a dramatic increase in the availability of data and the tools for analyzing it—and look forward to making productive use of them.

- Set an expectation with your Head that data should be part of important feedback loops (e.g. personnel evaluations, board reports, annual “state of the school” reports, etc.) and discussed with various constituent groups.
- When selecting new board members, schools should weigh candidates’ data literacy and available skills/resources related to data.

## For Associations

Whether it’s facilitating the accreditation process, supplying examples of best practice, credentialing, or providing direct professional development, our regional and professional associations are an important source of guidance for our schools. CIRIS hopes to be a partner with our associations to help provide the following tools for association members.

- The staff in our offices (Admission, Business Office, Development, Diversity Equity Inclusion Belonging (DEIB), Wellness, College Counseling, Technology, and Registrar) want to know more about what schools are doing with IR. Consider making examples of IR projects in your topic area a regular part of your website, social media presence, newsletters, magazine, or other communication resources.
- Incorporate sessions about IR skill development specific to your functional area into your conference and professional development offerings. CIRIS would like to specifically recognize ATLIS for the model of collaboration they’ve set up with CIRIS over the last several years to provide PD opportunities and conference programming to impactfully support members of both organizations. CIRIS looks forward to working with additional associations in similar partnerships in the future.

In recent years, regional and state accrediting agencies have encouraged the use of data to both substantiate and illustrate dimensions of student learning. This shift is underscored by the 2013 adoption of Criterion 13 in the Standards issued by the NAIS Commission on Accreditation:

“The standards require a school to provide evidence of a thoughtful process, respectful of its mission, for the collection and use in school decision-making of data (both internal and external) about student learning.”

Similarly, from the Southern Association of Independent Schools, “The goal of the self-study process is to identify three to five major goals for school improvement. The school report documents the self-study process and thoroughly describes the school’s plan to achieve these goals...What measures will the school use to chart its progress? Measurable results that will demonstrate to the school its movement towards the selected institutional goal(s).”

- Because IR in independent schools is a newly emerging field, there is a need for reference materials around best practices and assessment instruments. Consider incorporating guidance in IR and data-related fields into your existing reference materials.

## For Vendors

- Vendors should support schools and their institutional research initiatives by adopting interoperability standards (e.g. oneroster, EdFi, well documented RESTful APIs). Vendors also shouldn't assume a school will use the full functionality of their systems because of external requirements (e.g. admissions associations requiring specific databases) and should work to make integration between systems easier.
- Engage with users in product development. Ideally, vendors would work with schools to solicit feedback on what data, metrics, and analysis would be useful and not make assumptions on behalf of schools. Our hopes for where our database tech is going are ambitious, and we'd love to collaborate with vendors to design that future.
- Data should be easy to export and generally available to client schools.
- Aspirationally, schools are looking for systems that do more than just house data (though we recognize that housing data is not trivial by any means.) Ideally, our database systems would be interoperable and perform some level of synthesis, whether that's through more useful native visualizations or machine learning algorithms that flag data patterns about students or other constituents that might need support.

## Conclusion

Even school communities with thriving Data Cultures and an openness to data need resources and support to help an institutional research program take root. They need financial resources and “political will” from their boards and Heads of School. They need adaptable technology tools that are designed with an eye towards insights rather than just task completion. They need guidance and professional development opportunities to support both institutional researchers and community-wide data literacy. Boards, Heads, associations, and technology vendors are pillars of the independent school ecosystem, and the institutional research community looks forward to continued collaboration as we co-create systems to best support our students and families.

# Data Strategy: Governance and Infrastructure

## Consider the following (perhaps familiar) scenario:

*Data Academy went test optional for Admission during the pandemic and is exploring whether they should continue this policy or go back to requiring standardized tests. To help make this decision, they decide to analyze their historical data to see if a correlation exists between past standardized test scores and the grades students earned when they attended the school, with a particular eye towards differences in this relationship by racial groups. Tragically, Data Academy was unable to complete this plan because they ran into the following challenges:*

- *Admission data lives in a different database than grade data, and there is no way to easily link information about individual students between the systems*
- *Providing race information during the Admission process is optional leading to an extremely incomplete data set of racial identities.*
- *Racial categories from the Admission database are not the same categories used in the SIS (student information system) so students have conflicting identities depending on which system the school pulls from.*
- *When entering grades into the SIS, teachers only input letter grades instead of numeric grades, so students who earned very different grades*

### Data Infrastructure

The set of systems that institutions use to collect, store, and share data (e.g. databases, spreadsheets, documents, etc.)

### Data Governance

A set of rules around access, entry, and maintenance of information in school data sets that ensures information is consistent, interoperable across systems, and can be flexibly leveraged to yield operational insights.

### Data Strategy

A holistic plan that identifies high-value data, determines how to collect, maintain, store, and analyze that data, articulates how that analysis will be communicated to stakeholders, and addresses community-wide data literacy and institutional change dynamics.



appear identical (e.g. student X earned an 89.5 while student Y earned a 92.4, but they both appear as an A- in the SIS)

- Data Academy switched Admission databases two years ago and they are unable to extract necessary data from the legacy system.

All of the obstacles Data Academy ran into in this scenario are issues of an underdeveloped **Data Strategy**, a concept that includes, but is not limited to data infrastructure and governance.

In a simplistic metaphor, data is like the vehicles moving from place to place in a transportation system. Data infrastructure includes the roads and parking lots the vehicles travel on and are stored in. Data governance corresponds to the laws that prescribe how the vehicles should be built and how they are driven on those roads. Data Strategy corresponds to urban planning that decides whether the transportation system is actually meeting the needs of the community (e.g. “Do we have roads and vehicles that actually go to the destinations we need with minimal traffic jams?”.)

## Data Strategy Best Practices

Data is the lifeblood of an institutional research program, so ensuring that your school has a solid foundation in Data Strategy is a prerequisite to the long term success of an IR program. In most schools, a variety of relatively siloed offices collect and store data relevant to the tasks of their jobs. In each of these offices, there are staff that fall into three functional categories (though the exact nomenclature of their role might vary from school to school).

Example: When thinking about an Admission database, the Data Steward would be the Director of Admission/Enrollment Management because the database exists within their department. The database administrator or office staff who actually input or export application information into/out of the system is the Data Custodian. This database has many Data Users: the Admission team uses the data to make admission decisions, the Business Office uses

### Data Steward

The faculty or staff member who is ultimately responsible for the contents of a data set.

### Data Custodian

The faculty or staff member who performs the data entry and maintenance of a data set.

### Data User

Faculty or staff members who consume data for operational use.

the data on incoming contracts for budgeting purposes, the Communications Office uses the data to shape outreach messages. An institutional researcher may use the data to study how Admission data is correlated with student outcomes.

This organizational structure can work well when the only use of data is to execute office-specific tasks (e.g. make Admission decisions, produce report cards and transcripts, etc.). Without a broader picture of how data from different offices can fit together to yield deeper insights however, the data generated in various silos may be impossible to merge together, require extensive cleaning before it is useful, or fail altogether to collect information that could be strategically valuable. Identifying high-value data, deciding how to collect and store it, how to train existing and onboard new Data Custodians, knowing how to best leverage the data for insights, and supporting the broader community in developing Data Literacy and Culture all fall into the domain of Data Strategy.

### Data Pitfall

In many schools, Data Custodians work scrupulously to maintain their databases and understandably become very protective of them. The only owner of a dataset, however, is the institution, and schools should be cautious about leaving decisions about which Data Users have a legitimate interest in accessing the data to individual Data Custodians. This is better left to the Data Strategy Committee.

## The Data Strategy Committee

Because maintaining a functional Data Strategy is an ongoing process that requires input from stakeholders across the institution, CIRIS recommends that schools form a standing Data Strategy committee composed of representatives from various departments including institutional researchers, Data Stewards/Custodians, the Director of IT, the Director of DEIB, and academic leaders. The committee should be led by a senior administrator who is responsible for overseeing the Data Strategy initiative at the institution.

Responsibilities - The Data Strategy Committee is responsible for setting the overall direction, goals, and priorities of the Data Strategy plan. Key responsibilities include:

- Defining the scope of the Data Strategy program

- Establishing data governance policies and procedures
- Identifying/assigning Data Stewards and Custodians
- Monitoring the implementation of the Data Strategy plan
- Arbitrating discussions of access privileges
- Ensuring compliance with relevant regulations and industry standards
- Identifying high-value data and designing collection methods
- [Vetting and prioritizing IR project requests](#)
- On a broad level, ensuring that the data and research systems at the school align with its strategic priorities
- Assessing and supporting the development of community data literacy
- Supplying resources to counter Data Skepticism and foster a healthy Data Culture

For a detailed list of typical Data Strategy committee members and their functions on the committee, see [this table](#). Here is [an example of a Data Governance Committee charter](#), courtesy of Phillips-Exeter Academy.

## Establishing a Data Strategy Framework

One of the first goals of a Data Strategy Committee is to assess the school's data infrastructure, governance systems, and policies to bring them in line with the school's operational and strategic goals. This initial process often flows through the following steps:

*Institutional research, when done well, takes the guesswork out of how effectively a school is meeting its mission and can provide profound insight into what opportunities set it apart in a competitive marketplace.*

– CHRISTINA LEWELLEN, MBA, CAE.  
EXECUTIVE DIRECTOR, ASSOCIATION  
OF TECHNOLOGY LEADERS IN  
INDEPENDENT SCHOOLS

## STEP 1: IDENTIFY KEY DATA DOMAINS

To establish an effective data governance framework, it is essential to identify the key data domains within the school. These domains may include student information, financial data, human resources data, academic data, etc. Identifying these domains helps in prioritizing data governance efforts and assigning appropriate data stewards.

## STEP 2: SET DATA GOVERNANCE GOALS

Establish clear and measurable goals for the data governance program. These goals should be aligned with the school's overall objectives and may include improving data quality, ensuring data privacy and security, increasing cross-silo data accessibility and interoperability, and promoting data-informed decision-making.

## STEP 3: ASSESS THE STATE OF YOUR CURRENT DATA INFRASTRUCTURE AND GOVERNANCE

A thorough assessment includes an institution-wide data inventory and mapping process.

A data inventory ([example](#)) includes a list of the school's data assets, including a description of each data element, its source, owner, format, and associated metadata. If possible, organize this inventory in a catalogue that will allow for easier navigation and exploration of institutional data. This inventory serves as a valuable resource for data stewards and custodians in managing and maintaining the school's data.

In addition to the data inventory, create a map ([examples](#)) that gives a visual representation of existing data assets and how data flows throughout your institution's data infrastructure. Such a map can help identify how data is

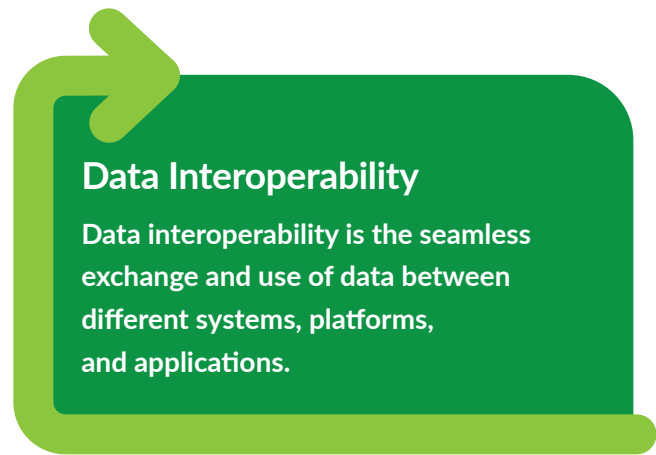
### Source of Truth

In school settings where multiple databases are in use, data conflicts can arise (e.g. a student has a different address stored in the admission database than they do in the SIS.) Establishing a "source of truth" identifies which system will always have the most accurate, up-to-date information. A goal of Data Strategy is to find ways to push this information out to other relevant systems.

used, transformed, and accessed across the institution. Also, a data map is useful in identifying various “sources of truth” when trying to access and combine data across multiple sources.

## STEP 4: DESIGN A SYSTEM THAT ALIGNS YOUR DATA INVENTORY WITH YOUR STRATEGIC GOALS

After completing a data inventory, many schools realize that, while the data they collect is necessary and useful, there are flaws in how that data is maintained, there are difficulties in integrating data sets from different systems, or there is additional data they would like to have but don't currently collect at all (e.g. feedback from students and other constituents or wellness or DEIB indicators.) This is an excellent opportunity for the Data Strategy committee to determine how to improve the quality of existing data and collect new data moving forward. A key consideration in the design of this system must be [data interoperability](#).



## STEP 5: ESTABLISH DATA QUALITY AND HANDLING STANDARDS FOR ALL DATA MOVING FORWARD

Create a comprehensive set of data governance policies for existing and new data and systems ([example](#)) that outline the school's expectations for data management, usage, and quality. Define clear data quality standards and metrics for each key data domain and document them in data style guides. These standards should address:

- Which office is responsible for collecting the data and when
- Data accuracy, completeness, consistency, and timeliness standards
- Data access controls, data privacy and security protocols
- How compliance with these standards will be assessed and monitored on an ongoing basis

## STEP 6: UPDATE EXISTING PROCESSES AND SYSTEMS TO SUPPORT THE CONTENT AND QUALITY OF YOUR DATA

To ensure the success of the data governance plan, integrate it with the school’s existing processes and systems. This integration may involve updating existing IT infrastructure, modifying data management processes, and aligning data governance efforts with the school’s overall strategic planning. For instance, a school might update their IT infrastructure to include a data warehouse for managing educational data that would allow them to consolidate all student-related data, improving accessibility and analysis. The table below gives some options for data infrastructure plans.

Any new procedures, roles, or responsibilities should also be communicated to staff. Clearly outline the roles and responsibilities of all stakeholders involved in monitoring and maintaining the newly outlined quality standards. This clarity ensures accountability and helps prevent confusion or overlap in tasks.

Strategy	Description	Pros	Cons
Shared File Storage and Working with CSV Files	This is a simple and cost-effective method of storing and sharing data. It involves storing data in CSV (Comma Separated Values) files, which can be opened in spreadsheet software like Microsoft Excel or Google Sheets. It is the most common way in which schools access their data.	<p>Easy to implement and use, requiring minimal technical expertise.</p> <p>Cost-effective, as it often uses existing software and hardware.</p> <p>CSV files are universally compatible with many systems and software.</p>	<p>Limited in terms of data security and access control.</p> <p>Difficult to manage as the volume and complexity of data grow.</p> <p>Data integrity can be compromised easily as CSV files can be edited by anyone with access.</p> <p>Lack of automation for data integration and updating.</p>

Strategy	Description	Pros	Cons
Data Warehouse and Data Lake Strategy	Data warehouses and data lakes are more advanced data storage solutions. A data warehouse stores structured data in a way that's optimized for reporting and analysis. A data lake stores large amounts of raw data in its native format, including structured, semi-structured, and unstructured data.	<p>Powerful and flexible, capable of handling large volumes of diverse data.</p> <p>Enables advanced data analysis and reporting capabilities.</p> <p>Data is centralized, improving data consistency and integrity.</p> <p>Better security and access control compared to shared file storage.</p>	<p>Requires significant upfront investment in hardware, software, and setup.</p> <p>Requires technical expertise to implement and manage.</p> <p>Data lakes, in particular, can become "data swamps" if not properly maintained, making it hard to find and use data.</p>
Cloud-Based Data Infrastructure	Cloud-based solutions offer data storage and management capabilities as a service. This can include data warehouses, data lakes, and other data management tools.	<p>Scalable and flexible, allowing you to easily adjust your data capacity as needed.</p> <p>Often offers robust data security and compliance features.</p> <p>Reduces the need for on-premises hardware and associated maintenance.</p>	<p>Ongoing subscription costs can add up over time.</p> <p>Dependence on an external provider for critical infrastructure.</p> <p>Potential issues with data sovereignty and compliance, depending on the provider and location of data centers.</p>
Third-Party Vendors/ Specialized Software Platforms	These are specialized software solutions provided by third-party vendors. They can offer a range of features, from data storage and integration to advanced analytics.	<p>Can offer robust, feature-rich solutions tailored to the needs of schools.</p> <p>Reduces the burden of technical management, as the vendor handles updates, security, and other technical aspects.</p> <p>Many offer user-friendly interfaces and strong customer support.</p>	<p>Can be expensive, with costs for licensing, implementation, and ongoing subscription fees.</p> <p>Dependence on a third-party vendor can lead to issues with data ownership and control.</p> <p>Integration with existing systems can be challenging, depending on the software.</p>

## STEP 7: ESTABLISH A COMMUNICATION AND TRAINING PLAN

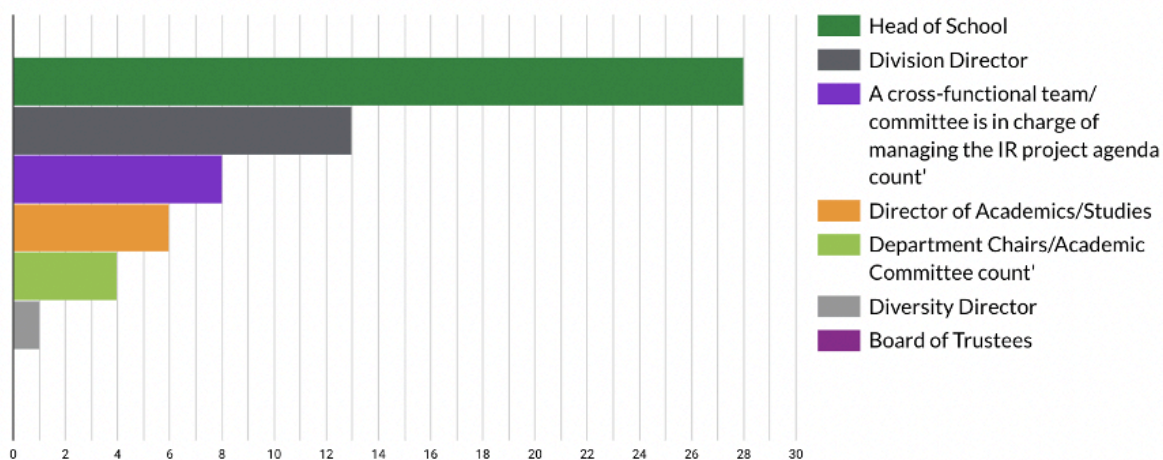
Once a school has the systems and procedures in place and has told staff what their new responsibilities are, it needs to support them in learning how to execute those responsibilities. Provide training and support to help current staff understand their roles in data governance and ensure they have the skills and knowledge necessary to effectively manage and

use data. Create an onboarding process that orients new staff to your institution's data governance standards.

## How do schools select IR Projects?

Given the breadth of potential applications of data analysis, it's easy to see how an institutional researcher can become overwhelmed with project ideas. How do schools allocate their institutional researcher's time and prioritize projects? The answer: it depends! The majority of institutional researchers who responded to the IR SOTI indicated that their Head of School is their direct supervisor and also primarily responsible for project selection.

### Who is primarily responsible for project selection at your school?



It is not clear, however, how Heads of School decide which projects to prioritize for their researchers. As noted elsewhere in this guidebook, there are different types of IR projects that meet different needs in a school community. Some projects are focused on institutional priorities laid out in the mission statement or strategic plan. Other projects simply make life easier for members of the community.

At CIRIS, we believe that it is important to have a mixture of project types. Strategic projects demonstrate to the community the importance and high-priority of leveraging data but may feel remote or disconnected from the day-to-day life of community members, doing little to invite them into the school's broader Data Culture. Process simplification projects, on the other hand, are powerful tools in winning the "hearts and minds" of a diverse



array of community members but may do little to directly advance strategic goals. We recommend that schools adopt a project selection process that blends “top-down” strategic work with “bottom-up” projects that grow organically around the community. This allows a balance between advancing large institutional goals while also using IR to build Data Culture and allyship around campus.

Because striking this balance between project types while also being mindful of the state of the school’s data architecture and governance while also being responsive to the broader community’s data literacy levels can be a complex task, we recommend entrusting IR project vetting and/or selection recommendations to a Data Strategy Committee that can represent an array of voices from around the community.

## Conclusion

In most schools, data governance, to the extent it exists by intention, is driven by task completion in separate silos. This leads to a set of data that only partially overlaps with the needs a school has to derive strategic insights from data assets. In order to pivot from a task-oriented to an insight-oriented Data Strategy, schools need to step back and set priorities for their data policies, examine their current data infrastructure and governance practices against those priorities, design a system that corrects gaps in data content, quality, completeness, and interoperability to meet those priorities, update existing or install new systems to accommodate those priorities, and then build a plan to train and support existing and incoming staff.

# Best Practices for Survey Strategy

## Consider the following (perhaps familiar) scenario:

*Data Academy sends out an annual survey to their Parent/Guardian community. They hope to use the feedback to guide policy decisions. Unfortunately, they only received responses from 15% of households, and, in reviewing the results, it was impossible to draw conclusions because school leaders raised concerns about the quality of the survey questions.*

Surveys offer a valuable method of collecting feedback from a wide cross-section of constituencies in school communities and can be invaluable in discerning what is true about a school experience and what individuals believe based on anecdotes or their own personal experiences. It is very common, however, for schools to struggle with many aspects of survey design and administration. In this chapter, we will walk through Survey Strategy, a subsection of an overall [Data Strategy](#) that includes determining whether a survey is necessary, identifying common errors in designing individual survey questions, overcoming challenges in administering single surveys, and answering broader questions around the number and timing of surveys across the school year.

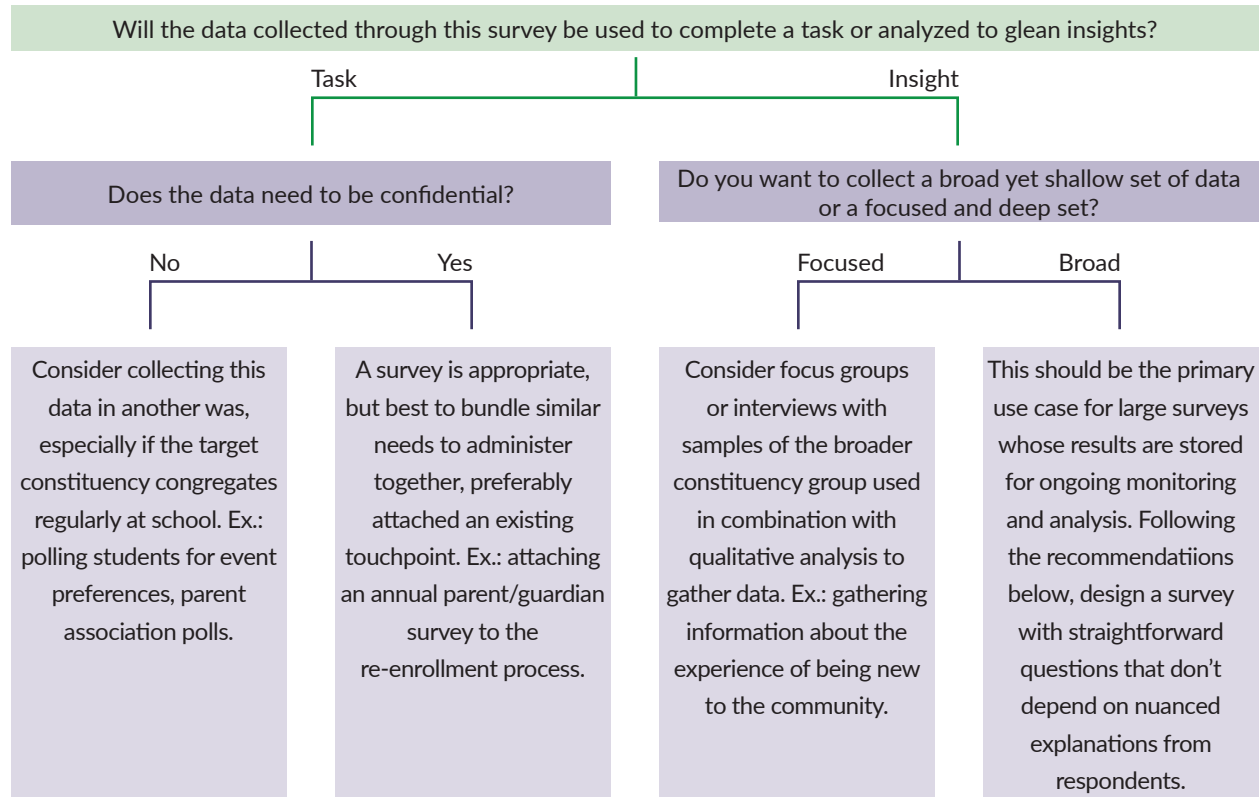
## Do We Need a Survey?

Survey Strategy is concerned with creating and administering surveys to collect strategically important data that can't be obtained through other methods. The first question to ask when contemplating sending a survey is, "Is this

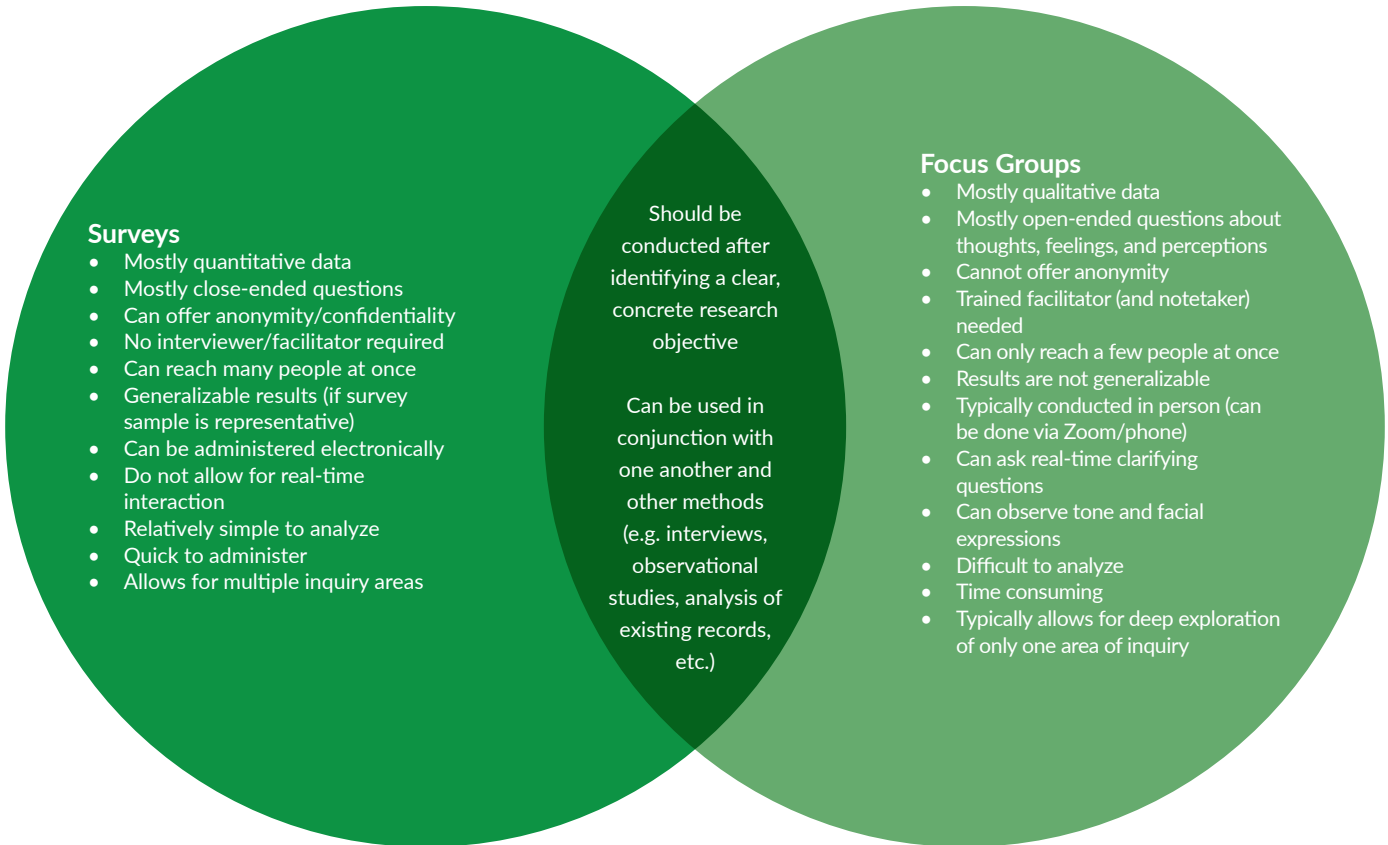
### What decision(s) will this survey support?

The goal of institutional research is to use data to support decision making. Survey data is no different. To avoid falling into the "survey trap" of collecting constituent feedback that ultimately just serves as context or background information for a small group of staff, schools should be able to answer the question, "What decision(s) will this survey feedback impact and who is making the decision?" before moving further in the survey creation process.

survey really necessary or is there a better way to get this information?" It's important to try to minimize the number of surveys constituents receive to avoid survey saturation and to promote participation in institutionally valuable surveys.



As you can see, surveys are not always the answer! In some cases, interviews or focus groups can yield more valuable information:



## To Buy or Build?

Once you’ve determined that a survey is necessary, the next step is to decide if you want to use an external survey or design your own survey in house. The table below outlines the pros and cons of each approach. For feedback about the experiences schools have had with various survey vendors, please see the [CIRIS Survey About Surveys](#).

*Institutional research allows us to have a more holistic view of our school’s performance, strengths, and areas for improvement. Most importantly, institutional data allows us to get to the heart of issues by uncovering patterns, trends, and correlations that might otherwise go unnoticed.*

– SUE BELCHER,  
HEAD OF SCHOOL, THE DOWNTOWN SCHOOL

	Pros	Cons	Use Cases
External Survey	<ul style="list-style-type: none"> <li>• Questions are already written and vetted</li> <li>• Often offer benchmarking against other schools who use the same survey</li> <li>• Vendor often handles the details of administration and analysis</li> <li>• Respondents may be more likely to give truthful answers on sensitive topics to outside parties</li> </ul>	<ul style="list-style-type: none"> <li>• Can be costly</li> <li>• Vendors may not release raw data to you for your own further analysis</li> <li>• Can be difficult or impossible to add/subtract/edit questions to make them relevant for your community. This can lead to getting results that are interesting background context for your school that don't actually impact decision making.</li> <li>• Inability to edit questions may lead to data inconsistencies between survey analysis and internal data categories</li> <li>• Vendors vary widely in the quality of their analysis and reporting format. Avoid vendors that dump a 100+ page pdf report on schools with only individual question level analysis and no overarching synthesis or takeaways.</li> </ul>	<p><b>Great for:</b> school or faculty climate surveys that ask sensitive questions respondents may not want to disclose directly to internal parties and where benchmarking to similar school communities is crucial to understand the context of results.</p> <p><b>Bad for:</b> collecting feedback on topics that are specific to your community or to custom metrics you've identified as strategically important</p>

	Pros	Cons	Use Cases
Internal Survey	<ul style="list-style-type: none"> <li>• Questions and answer options can be customized to integrate exactly with your data governance and institutional priorities</li> <li>• Can create questions that specifically tie to your school’s mission so that results can be used to impact decision making</li> <li>• Can be a lower cost option</li> <li>• Can incorporate questions with publicly available benchmarks for limited comparison</li> <li>• Going through the process of creating the survey can sharpen its focus and build buy-in of the results among internal stakeholders</li> <li>• Your school owns the data and can use it for analysis in future projects</li> </ul>	<ul style="list-style-type: none"> <li>• The survey creation process can add time demands on a wide swath of staff</li> <li>• Limited ability to contextualize results against a peer group</li> <li>• Must be careful that the person analyzing the results is perceived as objective and without an agenda to nudge results towards any specific outcome</li> </ul>	<p><b>Great for:</b> collecting data on institution-specific mission, values, etc. that may not be addressed by external instruments.</p> <p><b>Bad for:</b> topics that require external context or benchmarking to properly interpret (e.g. a survey on the prevalence of academic dishonesty.)</p>

## Anonymity

If you decide to draft your own internal survey, the next step is to think about what level of anonymity the survey will preserve. We’ve listed some popular options below but some of these strategies are only feasible if you have someone in an IR role who acts as an intermediary between the raw results and the analysis presented to school leaders.

**Beginnings and Endings**

Schools often craft surveys with current constituents in mind. CIRIS would recommend special attention to constituents who are just entering or just leaving the community. Incorporating a survey as part of the enrollment/ onboarding and exit processes can yield extremely valuable insights.

Anonymity Level	Description	Pros	Cons
Fully anonymous	The survey does not ask for or track any piece of information that could identify a respondent	<ul style="list-style-type: none"> <li>Can make respondents more likely to share honest opinions, especially if the topic is sensitive or could raise a fear of retaliation</li> </ul>	<ul style="list-style-type: none"> <li>Impossible to verify the representativeness of the sample, to drive targeted responses, or to do any sub-group analysis</li> <li>Impossible to link individual responses to other school data</li> <li>Be extremely cautious about asking any questions on this type of survey that would compel intervention (e.g. threats of harm, allegations of impropriety, etc.)</li> </ul>
Anonymous with demographics	This survey does not collect the name/email address of respondents but does ask for important demographic identifiers. Only the institutional researcher has access to the raw results showing all of the identifiers for any given respondent. An example use case might be student course evaluations.	<ul style="list-style-type: none"> <li>Preserves a strong sense of anonymity</li> <li>Allows for testing that the sample reflects the broader constituency</li> <li>Allows for sub-group analysis at broad levels</li> </ul>	<ul style="list-style-type: none"> <li>Respondents may worry that the institutional researcher could expose their identity by allowing school leaders to layer identifiers onto responses (for techniques to avoid this, see the <a href="#">Data Analysis chapter</a>)</li> <li>Individual level results can't be linked to other school data.</li> </ul>
Confidential but Not Anonymous	The survey collects the respondent's identity (name, email address, etc.) but only the institutional researcher has access to that information. A use case would be a Thrive Model where student survey feedback is merged with internal school data.	<ul style="list-style-type: none"> <li>Allows the institutional researcher to link survey responses to other school data for interesting analysis (e.g. connecting wellness feedback from a survey to grade data to explore if there's a correlation between wellness and academic achievement)</li> <li>Easy to drive responses and validate the representativeness of the sample</li> <li>Over time, respondents learn to trust the confidentiality of the system</li> </ul>	<ul style="list-style-type: none"> <li>Respondents might not initially trust the confidentiality of the system</li> <li>Difficult to ask questions that would compel the institutional researcher to break confidentiality (threats of harm, allegations of impropriety, etc.)</li> <li>Even if respondents generally trust the institutional researcher, they are less likely to be honest about sensitive topics like academic dishonesty, etc.</li> </ul>

Anonymity Level	Description	Pros	Cons
Fully identifiable	The survey collects the respondent's identity, and it is included in the results	<ul style="list-style-type: none"> <li>Useful if one of the goals of the survey is to identify individuals who are interested in or would be candidates for additional engagement with the school (looking for parent or alumni ambassadors, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Not useful for truly broad research because it implicitly invites honest responses only from community members who already feel comfortable and "at home" at the school.</li> </ul>

## Writing Questions

If you've decided to use an internal survey and you've selected an anonymity level, it's time to write questions! Good survey questions have the following characteristics:

- They have an unambiguous meaning that virtually all respondents can interpret in the same way.
- They invite the respondent's honest answer.
- The question format types are selected to support post-survey analysis of results.
- The answer options are consistent with your broader data governance standards (e.g. categories for demographic identifiers match or can be mapped to the options in your SIS).
- For repeated surveys (e.g. an annual survey), the core questions are stable and are not edited each year.
- Individual questions on a survey flow in a meaningful storyline for the respondent from one question to the next, either in a time sequence or by category

In the section below, we will outline some common missteps that prevent survey questions from meeting these standards.



# Common Survey Question Missteps

Common Misstep	Description	Problematic Example	Good Example
Double-barreling	A question asking about multiple concepts or components	“How much do you enjoy collecting and analyzing data?” → <i>What if someone enjoys analyzing data, but does not enjoy collecting data?</i>	“How much, if at all, do you enjoy collecting data?” “How much, if at all, do you enjoy analyzing data?”
Leading Questions	A question or scaling that is worded in a certain way so as to elicit a preferred answer or limit unwanted responses	“How much do you agree with the following statement?” <ul style="list-style-type: none"> <li>Agree a little</li> <li>Agree</li> <li>Agree a lot</li> <li>Strongly Agree</li> </ul> → <i>There is no option for disagreeing!</i>	“How much do you agree or disagree with the following statement?” <ul style="list-style-type: none"> <li>Strongly Disagree</li> <li>Disagree</li> <li>Neutral/ Unsure</li> <li>Agree</li> <li>Strongly Agree</li> </ul>
Leaving out stakeholder groups	A question that certain stakeholder groups might not be able to answer due to their specific context	“What was the maximum amount of financial assistance that your student was offered by another secondary school to which they were accepted?” → <i>What if the student was not accepted at any other schools or they weren’t offered any financial assistance at another school?</i>	“Was your student accepted to multiple schools?” “If yes, was your student offered financial assistance by another secondary school?” “If yes, what was the maximum amount of financial assistance that your student was offered?”
Excessive Complexity/Use of Jargon	Questions that use complex language, sentence structure, or are detailed to the point that the respondent gets confused about how to answer	“How would you rate the pedagogical efficacy of the dialectical approach to primary source materials compared to a more pragmatic or existential methodology?”	“How would you rate the effectiveness of small group discussions in this course?”

## Question Format Options

Writing the body and answer options for each question should be considered alongside the format of the question. Use item type to engage but not deter the respondent (e.g., don’t ask respondents three essay questions in a row, or ask them to do a complex task like 100-pt allocation followed by a matrix rating scale.) A non-exhaustive list of common formats with pros and cons appear below.

## SINGLE-SELECT

This type of question has multiple answers of which the respondent can select one. Response options can be nominal or ordinal (e.g. Likert).

### Example:

- During your life, how often have you felt that you were treated badly or unfairly in school because of your race or ethnicity?
- A. Never
  - B. Rarely
  - C. Sometimes
  - D. Most of the time
  - E. Always

(YRBS, 2023)

**Pro(s):** The simplicity of this type of question makes the answers easy to clean and analyze

**Con(s):** Confines respondents to specific choices

## MULTI-SELECT

This type of question has multiple answers of which the respondent can select all that apply.

### Example:

Do you typically do the following when completing your homework?

- Check email
- Use social media
- Eat a meal

**Pro(s):** Does not force respondents to select a single response when multiple response options are applicable to them

**Con(s):** Respondents tend to use a satisficing response strategy in which they are more likely to select the items appearing in the top half of the list than the bottom regardless of what those items were (can be overcome with answer choice order randomization functionality)

Data cleaning and analysis is more cumbersome, can require double counting, and raises sticky and complex philosophical and ethical questions

## TEXT ENTRY

A question with space for an open-ended response that allows respondents to formulate their responses however they want

**Example:**

What was your favorite part of today’s Advising programming?

**Pro(s):** Allows respondents to provide their reply in their own words, providing a sense of user control over the narrative

**Con(s):** Text analysis of the responses can be cumbersome

Requires deeper thought from the respondent, which can lead to short, undetailed responses or item non-response

## MATRIX TABLE

This type of question allows you to combine multiple questions with the same answers

**Example:**

How satisfied, if at all, were you with the following aspects of your campus visit?

	Not at all satisfied	Slightly satisfied	Somewhat satisfied	Quite satisfied	Extremely satisfied
Campus Tour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interview	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Pro(s):** Reduces the time to complete multiple questions

Less space required in the survey

**Con(s):** Can lead to boredom and/or straight-lining (e.g. selecting the same response for each item without careful consideration of each row)

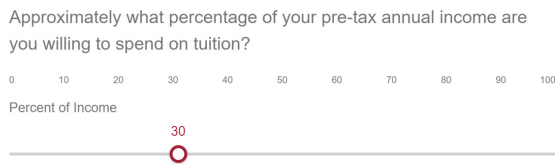
Can be difficult to view and complete on mobile devices

On some platforms, response format is cumbersome on the backend

## SLIDER

This type of question uses an interactive slider as a marker on a scale that best describes response options

### Example:



**Pro(s):** Provides near infinite response options for the respondent.

**Con(s):** Take longer for respondents to complete and may cause respondents to quit the survey at higher rates than ordinal close-ended questions

Respondents are likely to move the slider from its default position even if the default accurately reflects their response

Difficult to complete on a mobile device

## RANK ORDER

This type of question asks the respondent to order a list of choices from their first choice to their last choice.

### Example:

Below are some possible graduation speakers. If you had to choose among these three speakers, which would be your first, second, and third choice?

Please move the items below by either clicking and dragging or using the up and down arrows. Place the items so that 1 corresponds to your most preferred/first choice and is placed at the top, 2 corresponds to your second choice and is placed below, and so on...

- 1.) Strawberry
- 2.) Chocolate
- 3.) Vanilla

**Pro(s):** Allows respondents to specify priorities and preferences from among multiple options

**Con(s):** Difficult for respondents to understand and complete correctly, particularly as the number of items to rank becomes large and on mobile devices

Consider cultural contexts and give clear instructions; the “number one” spot is not the “best” in all cultures.

Time consuming

## FORCED CHOICE

An alternative to a multi-select question that requires respondents to make an explicit yes/no judgment about each item independently

### Example:

Do you typically do the following when completing your homework?

	Yes	No
Check email	<input type="radio"/>	<input type="radio"/>
Use social media	<input type="radio"/>	<input type="radio"/>
Eat a meal	<input type="radio"/>	<input type="radio"/>

**Pro(s):** Less likely to lead to satisficing responses than multi-select

**Con(s):** Can only be used for questions with dichotomous (yes/no) answer choices so they are not applicable to all areas of inquiry.

## NET PROMOTER

This is a specific question asking respondents to rate how likely they would recommend a certain experience to a friend on a scale of 0 - 10. Scores are aggregated into a “net promoter score” (NPS) that ranges from -100 to 100.

### Example:

How likely, if at all, are you to recommend the peer tutor program to another student at Data Academy?

Not at all likely											Extremely likely
0	1	2	3	4	5	6	7	8	9	10	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Pro(s):** Simple, common and easy to understand for the respondent with plenty of research on interpreting the scores.

Can be computed and compared across constituent groups and to external benchmarks

**Con(s):** On its own, the response will not illuminate why a respondent answered the way that they did.

## Survey Introductions and Instructions

In addition to the questions themselves, make sure to invest the appropriate time and attention in writing an introduction to the survey for respondents. The introduction should include information about why the school is doing the survey, who should complete the survey, approximately how long the survey will take, who will have access to the raw results and who will not, how and with whom the analysis will be shared, and should address the use of any questions that might raise flags for the respondent (for example, collecting demographic information on an anonymous survey.)

Once you have created a draft of your survey, you should share it with a group of testers who were not involved in the drafting process and solicit feedback about question clarity and completeness. This is also a crucial step in checking that structural elements of the survey function correctly (e.g. if a respondent does not receive financial aid, they skip the survey section on financial aid.)

## Sending Out Your Survey

If you did not build your survey draft within a specific platform, it's time to embed your survey questions into a platform so you can distribute it. The table below covers options for survey platforms available to schools:

Name	Cost	Pros	Cons	Documentation
Google Forms and Microsoft Forms	Free	Free to use, easy to co-create, share and collect responses, integrates well with other Google/Microsoft products, etc.	Limited question types, limited design customization, less sophisticated analytics, data is decentralized	<ul style="list-style-type: none"> <li>• <a href="#">Security</a></li> <li>• <a href="#">Logic</a></li> <li>• <a href="#">Reporting</a></li> <li>• <a href="#">Question Types</a></li> <li>• <a href="#">Distribution</a></li> <li>• <a href="#">Centralization</a></li> <li>• <a href="#">Microsoft Forms Support</a></li> </ul>

Name	Cost	Pros	Cons	Documentation
SurveyMonkey	Free for basic plan; Paid plans based on users and features	Easy to use, wide range of question types, good analytics tools, mobile app available. Options for multilingual surveys, skip logic, sentiment analysis, data trending, and filtering.	More difficult to co-create surveys with others. Limited responses for free plans, higher-level plans can be more expensive, limited customization and design options.	<ul style="list-style-type: none"> <li>• <a href="#">Security</a></li> <li>• <a href="#">Logic</a></li> <li>• <a href="#">Reporting</a></li> <li>• <a href="#">Question Types</a></li> <li>• <a href="#">Centralization</a></li> <li>• <a href="#">Distribution</a></li> </ul>
Alchemer/ Survey Gizmo	\$315 per year and up; The “full access” version is \$1895 per year	From their website, they say it perfectly: “For organizations that need more advanced capabilities and reporting than SurveyMonkey and don’t want the cost and complexities associated with Qualtrics, Alchemer Survey strikes the perfect balance.”	Hard to manage if you have multiple surveyors who need access; similarly, it doesn’t organize surveys into folders as intuitively as higher priced platforms.	<ul style="list-style-type: none"> <li>• <a href="#">Compare versions</a></li> <li>• <a href="#">Security</a></li> <li>• <a href="#">Logic</a></li> <li>• <a href="#">Reporting</a></li> <li>• <a href="#">Question Types</a></li> <li>• <a href="#">User Centralization</a></li> <li>• <a href="#">Distribution</a></li> </ul>
Qualtrics	Free for simple surveys and basic data analysis; Paid tier for additional features	Qualtrics is the gold standard for surveys. Powerful and flexible, advanced question types, robust analytics tools, ability to conduct longitudinal studies; sentiment analysis (paid tier); advanced security and directory integrations; centralized responses	More complex to use, potentially expensive, may be overkill for simple surveys	<ul style="list-style-type: none"> <li>• <a href="#">Security</a></li> <li>• <a href="#">Security statement</a></li> <li>• <a href="#">Logic</a></li> <li>• <a href="#">Question Behavior</a></li> <li>• <a href="#">Reporting</a></li> <li>• <a href="#">Question Types</a></li> <li>• <a href="#">Centralization</a></li> <li>• <a href="#">Distribution</a></li> </ul>
Formsite	Free; Paid tier for additional features	Affordable, user-friendly, robust features for complex surveys, customizable notifications, external data integrations	Form building requires more experience, less intuitive response layout	<ul style="list-style-type: none"> <li>• <a href="#">Security</a></li> <li>• <a href="#">Logic</a></li> <li>• <a href="#">Reporting</a></li> <li>• <a href="#">Question Types</a></li> <li>• <a href="#">Centralization</a></li> </ul>

## Launching the Survey and Driving Responses

Whether you are using an internal or external survey, you want people to respond to it. The first consideration is when to administer your survey. Consider the timing of the survey in the context of the broader school calendar. Avoid surveying directly after events that elicit strong reactions (e.g. exam days for students, announcement of tuition increases for next

year for parents/guardians, etc.) and try to keep the timing of repeated surveys consistent from year to year.

Once you've identified an appropriate survey window, consider the following strategies to drive responses:

- Pre-announce your survey. Whether the survey will be completed in person or distributed asynchronously, it is best to let the constituency know that a survey is coming. This is especially important if the survey will be sent by an unfamiliar email address (e.g. a contracted third party or a survey platform.) Let them know when the survey will be arriving and what the sending address will look like. This will reduce the rates at which respondents delete or filter the survey simply because it looks unfamiliar.
- Whenever it is logistically feasible, the best way to obtain responses is to carve out time for the entire constituency group to complete the survey. For student course evaluations or self-assessment surveys, time should be carved out in classes, advising, or assemblies. Parent/guardian surveys could be a scheduled part of open houses or conference days.
- For constituencies that are not “captive audiences,” response rates will be driven by follow-up messages. Only send reminders or follow up messages to those who have not yet responded. More sophisticated survey platforms can track who has and has not responded, even for anonymous surveys. On simpler platforms, you may need to do some work on the back end to easily generate non-responder contact lists for follow ups.
- Follow up messages should not be repeated copies of the same text. Consider sending requests to complete the survey from a variety of sources on a predetermined schedule (e.g. Head of School, then Division Directors, then Grade Deans, etc.). Reminders should also come in a variety of formats like email or in-person announcements at events.
- Consider offering incentives for responders. For example, all respondents might be entered in a drawing for a prize. This is feasible for all non-anonymous surveys and for anonymous surveys administered through more sophisticated survey platforms.



## On Response Rates

One of the most common questions people have is, “How many responses are ‘enough?’” or “What is a good response rate?”

In our albeit anecdotal experience, response rates for on-campus “captive audiences” are usually between 95%-100%. For surveys of dispersed constituencies, like parent and guardians, a response rate of 40% is typical and strong (though a 40% response rate for all parents/guardians may cover 60%-70% of households.) In surveys of dispersed constituencies that offer an incentive, response rates can reach upwards of 70%.

An equally (if not more) important consideration than response rate, however, is representativeness of the sample of responders who complete the survey. Ideally, your sample will reflect the mix of demographic characteristics present in your overall school population. It is important to collect demographic information on factors you think are relevant to the topic under consideration on the survey itself, even if it is anonymous. Provided that the sample is representative and you have at least 30

responses, there is statistical justification to generalize your results to the whole population even if the response rate is as low as 15%. A low number of responses will, however, limit the types of analysis you can do with the responses. For both anonymity and statistical reasons, it is unwise to report average results for subgroups with fewer than 10 observations, a floor that is easier to reach when the overall number of responses is lower.

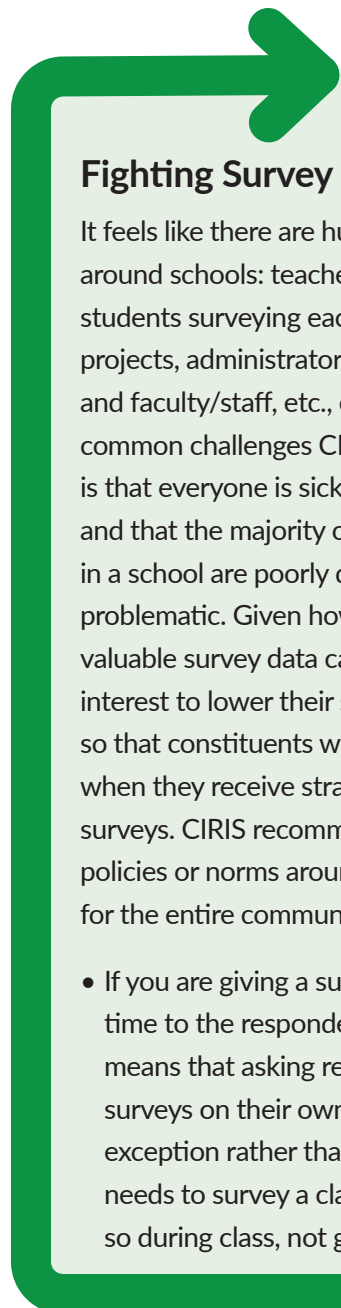
Another issue that arises with low response rates is that respondents with strong opinions are often more likely to respond and respond early. If you don’t increase your response rate, you may be left with a sample that overstates how polarized your community is. Over time, you can get a sense of how severe this effect is at your school by informally comparing average responses from the first chronological wave of responses with averages from the responses that came in towards the end of your survey window.

## “Survey Fatigue” and Declining Response Rates Over Time

When schools struggle with achieving adequate response rates, the most common first explanation is that constituents are receiving too many surveys and therefore have come down with the dreaded “survey fatigue.” In response, the school will sometimes scale back important survey work to relieve said fatigue.

To discuss this issue, we must first clarify the definitions of some terms that are often conflated:

- Survey fatigue: In scholarly research on surveys, “survey fatigue” most often comes up in reference to the length of a single survey (i.e. the survey is too long so respondents get tired and quit.)
- Survey saturation: a constituency disengages from even starting surveys or giving honest/thoughtful responses because they receive too many separate surveys in a specific window of time.



### Fighting Survey Saturation

It feels like there are hundreds of surveys flying around schools: teachers surveying students, students surveying each other for school projects, administrators surveying students and faculty/staff, etc., etc. One of the most common challenges CIRIS hears from schools is that everyone is sick of getting surveys and that the majority of surveys circulating in a school are poorly designed or otherwise problematic. Given how important and valuable survey data can be, it is in a school’s interest to lower their survey saturation rates so that constituents will not feel over-taxed when they receive strategically important surveys. CIRIS recommends developing some policies or norms around survey administration for the entire community:

- If you are giving a survey, you also give the time to the respondents to complete it. This means that asking respondents to complete surveys on their own time should be the exception rather than the rule. If a teacher needs to survey a class, they should do so during class, not give it in addition to a normal homework assignment. If students need to survey each other to generate data for a project, the survey should visit other classes or find teachers willing to donate class time to having their students complete it. If administrators need to survey students or faculty, there should be time to complete the survey in advising, assembly, or scheduled faculty meetings.
- Exceptions: some surveys might be sensitive and would better be completed in private. Any survey that is sensitive enough to need to be completed in private or on the respondent’s own time should probably be vetted by staff with expertise in survey design. Creating a survey vetting process and a standard for when it should be applied can help reduce your school’s feeling that they are repeatedly wasting their free time on poorly-designed, inconsequential surveys and can provide a mechanism to build your community’s survey design knowledge over time.

While both “survey fatigue” and “saturation” are actual issues, they are often not the main drivers of low response rates, particularly if response rates have been high in the past and are declining. In fact, if there is one truth independent school leaders know it’s that our constituents never get tired of sharing their opinions about the school! In reality, declining response rates are often a symptom of an underdeveloped [Data Culture](#). If school leaders are not looping back to constituencies who completed the survey, acting on the feedback they receive, or are not clearly explaining how policy decisions are linked to constituent feedback, then response rates will decline because our constituents *do* get fatigued of feeling like they are being ignored or that school surveys are a waste of their time.

In order to keep your survey strategy aligned with your school’s Data Culture, carefully consider the frequency of surveys. Don’t survey a constituency on a topic area twice a year if you know that it will take at least a full year to implement and observe the effectiveness of policy changes based on those survey results. It is also essential that you loop back to the constituency that completed the survey to share back some of the results. These results do not need to be reported publicly in the same level of detail as you see internally, but some acknowledgement of what you took away from the results is crucial to show constituents that you’ve heard them.

## Conclusion

Surveys can be an indispensable part of your school’s broader Data Strategy but knowing when a survey is the best method to collect data, deciding whether to use an internal or external survey, crafting high-quality questions, and coordinating survey administrations across the school year can be challenging. The suggestions above will help you design and implement a successful Survey Strategy. For additional reading in this rich topic area, we direct you to the resources linked below.

### FOR FURTHER READING:

- [Survey design tips from Pew Research](#)
- [Survey design tips from Qualtrics](#)
- [Survey design tips from Survey Monkey](#)
- [Survey design tips from Panorama](#)

# Data Analysis

## Consider the following (perhaps familiar) scenario:

*An institutional researcher successfully compiles a large data set of student course grades, self-assessments, and demographics for the last 10 years. There are thousands of possible summary statistics they could compute and visualizations they could make. They aren't sure where to start.*

*An institutional researcher completes some data exploration and finds that there is a half point difference in average grades for male and female students. Using a stats analysis platform, they click a button to do a hypothesis test (the stats platform calls it a “z-test,” though they aren't totally sure what that means) and find that this difference in average grades is statistically significant. Meanwhile, the “z-test” button says that a difference of 5 points in the average grades of Black and Middle Eastern students is not significant. The institutional researcher is not sure how to explain this to school leadership.*

One of the most common questions CIRIS gets from new institutional researchers is “How much statistics knowledge do I need to do this job?” To understand the answer to this question, it's important to acknowledge the differences between academic research that is published in journals and IR (institutional research) work carried out in independent schools. In our schools, we are not typically attempting to discern a trend or pattern that is true about all students everywhere, nor do we typically work with data sets that meet the size and integrity standards typically used in academic research. The goal of IR in independent schools is to yield practical, actionable operational insights to effect marginal changes that will be iteratively reassessed as we move forward. Our data analysis *informs* conversations about the school, it does not *drive* those discussions. Many of these types of insights can be discerned using a basic set of statistical techniques (many of which schools cover in their introductory statistics courses.) How much statistics knowledge does a new institutional researcher need? Not that much. Having a deep background in statistics is certainly helpful, but starting from scratch in this area shouldn't deter a school from getting going.

In this chapter, we will NOT attempt to cover the entire field of statistics but rather touch on basic statistical considerations like:

- Pre-conditions for data analysis
- The broad goals of statistical analysis
- Common types of data
- A prioritization of statistical analysis concepts institutional researchers need for different types of data
- Case studies of IR projects using statistical analysis techniques

## Pre-conditions for Data Analysis

Before you can do any analysis of your data set, you have to make sure the data set is clean and formatted correctly. Institutional researchers spend a substantial portion of their time getting the data ready for analysis (e.g. correcting typos, merging data sets from different sources, etc.) The vast majority of this work typically happens in a spreadsheet platform. Therefore, the first learning goal we would recommend for institutional researchers is to learn a list of extremely useful spreadsheet functions. Not only will they reduce the time and tedium required to clean data sets, but many of these functions (or extremely close versions of them) also exist within dashboarding platforms, so knowing what they do and how to use them will have benefits even outside of spreadsheets. We offer the following list of functions as a basic toolkit. This list comes from Google Sheets, but they all have analogues in Excel and other platforms:

- [COUNTIFS\(\)](#): counts how many observations in a given column meet one or more criteria.
- [SUMIFS\(\)](#): adds up observations in a given column that meet one or more criteria.
- [AVERAGEIFS\(\)](#): same as above, but finds the average value of the observations in a column that meet one or more conditions.
- [FILTER\(\)](#): returns a list of values in one column given that values in that column and/or other columns meet certain criteria. For example, you can filter a list of names to only return names of Asian males, etc. The

FILTER() function does support both inequalities and the wildcard character \*. Also useful for merging data sets.

- **VLOOKUP():** Useful for merging data sets. You can use this function if you have two datasets that share a unique identifier. For example, if you have one dataset with student id and race, and another dataset with student id, course, and grade, then you can use the VLOOKUP to “lookup” the race for each student id in the first data set and add that information for every matching student id in the second data set.
- **IFERROR():** allows you to reduce error messages generated by formulas in your data set. Example: a formula in one of your columns is =A2/B2, but sometimes the values in column B are zero, which produces a #DIV/0! error in some cells, which then adversely affects other formulas. If you use IFERROR(A2/B2), any cell that produces an error will just stay blank (or return any value you choose.)
- **UNIQUE():** returns a list of the unique values from a certain column. Example: you have a data set where each student ID appears many times, but you’d like to convert that to a data set where each student has a single row. You’d start your new data set by creating a column: =UNIQUE(Student ID column). You could then use the FILTER() or VLOOKUP() functions to build the rest of the data set.
- **SPLIT():** breaks an existing cell into multiple cells based on a specific character. Ex. there’s a column for “Last Name, First” Name in your data set, and you want two separate that into two separate fields. SPLIT(Name Column, “,”) will split the cell at the comma and produce one column for Last Name and one for First Name.
- **CONCATENATE():** Does the reverse of SPLIT() for text data (the CONCAT() function does the same for numeric data). CONCATENATE>Last Name, “,”, First Name) would produce a single column in the “Last Name, First Name” format.

Some spreadsheets also offer broader [data cleanup suggestions](#) that can be useful. For a demonstration of how to use these commands to build an interactive dashboard in Google Sheets, see the Creating Interactive Dashboards in Google Sheets video [here](#).

# The Goals of Statistical Analysis

Once your data set is in good shape, statistical analysis generally follows two stages, each with corresponding analysis techniques. First, we explore what the data say using descriptive statistics. In this stage, we have no interest in assessing whether what we are seeing is “good” or “bad.” The goal is simply to appropriately aggregate a large number of observations into a much smaller number of statistics that describe the “typical” experience expressed in the data set.

In the second phase of data analysis, we examine the likelihood that the “typical experience” we derived from our source data can be generalized to the whole population and whether those results are institutionally important (for good or bad reasons.) It is important to understand that statistics can meaningfully guide the first part of this phase, but there is no branch of mathematics that can inform the second phase. As discussed below, statistical significance and institutional importance are two separate concepts, and school leaders should anticipate the need to create their own community standards for what constitutes “good” and “bad” results.

## Types of Data: Quantitative, Categorical, Qualitative

The techniques an analyst deploys for both descriptive exploration and inferential analysis depends on the type of data under consideration. Therefore, identifying the type(s) of data in your data set is always your first step in analysis. Common data types are:

**Quantitative data** is numerical in nature and represents quantities or measurements. Quantitative data can be **univariate** or **multivariate**. Common school examples of univariate quantitative data might include the number of students enrolled, numeric grades, number of applications, or number of faculty of color. In a multivariate data set, each observation is comprised of two (or more) pieces of linked information. For example, we might have a data set that includes standardized test scores and GPA for each student. Each observation in this bivariate data set is therefore a pair of numbers.

**Categorical data** represents different categories or groups and is typically non-numerical in nature (aka, they often appear as letters or words in a data set). There are two types of categorical data: Nominal and Ordinal.

**Nominal categorical data** do not have any intrinsic order or ranking. Examples include gender (male, female, other) or racial identity. **Ordinal categorical data** have a specific order or ranking. However, the differences between the categories may not be equal. Examples might include rating scales (poor, fair, good, excellent) or satisfaction levels (low, medium, high).

**Qualitative data** provides descriptive information and is typically non-numerical in nature. It involves gathering data through observations, surveys, interviews, or open-ended questions.


Examples of qualitative data include interview or focus group transcripts, survey responses with open-ended questions, or recorded observations.

## “Must have” Analysis Techniques for Univariate Quantitative Data

Data Analysis	Measures	Description
<b>Descriptive analysis</b> explores data to summarize, present, or describe it in meaningful ways and make it easier to digest through aggregation and visualization. Descriptive analysis provides approachable entry points toward deeper analysis and serves as a valuable tool for generating accessible and actionable insights.	Center	The average (mean) and median are the metrics most often used to assess the center of a quantitative data field. We often use the mean when measuring GPAs or average number of advanced courses. The mean is affected by values that are significantly higher or lower than most of the other values (aka outliers). The median is the middle value of an ordered set of values and is resistant to outliers. We might use the median to measure the typical number of missed classes.
	Counts	Simply counting the number of occurrences is an easy way to get started when analyzing quantitative data. Examples include counting the number of discipline-specific courses in which students are enrolled or counting the number of extracurricular duties a faculty member does in a year.
	Outliers	Outliers are quantitative data values that are significantly higher or lower than most of the other values. There are methods for identifying outliers using the standard deviation of the data set or the interquartile range (IQR). If your data set contains outliers, you will need to determine whether or not they should be excluded from your analysis (see linked resource.)
	Percentages	Taking simple counts and dividing by the total number will give you a percentage. Percentages are useful when comparing categories from different populations. For example you might be comparing a total of 45 males from an 11th grade class of 84 students ( $45/84 = 54\%$ ) to a total of 48 males from a 12th grade class of 93 students (52%).
	Variability	Variability is a measure of how spread out quantitative data is from the center. Range (max value - min value), interquartile range (75th percentile value - 25th percentile value), variance, and standard deviation are all metrics used to assess variability. Even if two data sets have the same center (average GPA for two sections of the same course), they could have different variabilities.



# “Must have” Analysis Techniques for Multivariate Quantitative Data

Data Analysis	Measures	Description
Regression and Modeling	Simple linear regression	Simple linear regression models explore the relationship between two quantities. They can tell you whether the quantities tend to move in the same direction (positive correlation), opposite directions (negative correlation), or have no linear correlation with each other. Under specific conditions, one might create a predictive model to anticipate the value of an unknown outcome based on a known input..
		 Correlation does not imply causation
	Multiple linear regression	Some models are more complicated and use several input variables for the purpose of prediction or associative modeling, therefore necessitating the use of a multiple linear regression. For example, a school’s LMS (learning management system) might have data including a student’s number of absences, number of late submissions, and number of content page views which might be used to model a student’s overall grade for that course. For example, students in a class who have submitted a fixed number of late assignments on average have a 5% lower grade compared to the rest of their peers in their class.

*Our IR projects in Human Resources are helping us better understand the decisions that candidates make, what services our employees are taking advantage of, and how to better educate teams about our extensive benefits on offer. This attention to hiring and retention is critical in our current market.*

– REBEKAH SOLLITTO,  
ASSISTANT HEAD OF SCHOOL,  
STRATEGIC INITIATIVES, POLY PREP  
COUNTRY DAY SCHOOL

# “Must have” Analysis Techniques for Qualitative Data

Data Analysis	Measures	Description
<p><b>Qualitative analysis</b> includes methods for extracting themes from participant feedback in the form of written or verbal answers to questions. These questions often aim at answering the “why” of institutional research. For example, a descriptive analysis might lead to noticing a drop in enrollment of female students in upper-level computer science courses. A researcher might then follow-up by asking female students (via survey, interview, or focus group), “What upper-level course offerings are you most likely to take and why?”</p>	Coding themes	<p>For a more hands on approach, you can use a different colored highlighter which are each assigned to a specific theme to physically highlight quotes. You usually need to read through all of the qualitative feedback, first, in order to generate a list of themes to associate with the colors of the highlighters. Then, you go back to highlight a physical copy of the text. Alternatively, you can use a Google Doc and an Extension such as Highlight Tool to accomplish the same task electronically.</p> <hr/> <p>Word clouds can provide a visual representation of qualitative feedback. There are free online word cloud generators such as the aptly named FreeWordCloudGenerator.com. Other statistical packages that are available include AtlasTI and MaxQDA.</p> <hr/> <p>Artificial Intelligence, like ChatGPT, can extract themes from qualitative data using prompts such as, “Extract 3-5 general themes from the following qualitative feedback...” and then including the written feedback. This technology is emerging and, while promising, should be reviewed.</p>
	Sentiment analysis	<p>Sentiment analysis is similar to coding themes and it uses the simple coding buckets of “positive”, “neutral”, and “negative.” This is a good analysis for understanding the general sense of how respondents feel about a certain topic.</p>

In the initial phase of analysis, institutional researchers typically generate many, many statistics and visualizations that are completely unremarkable and will never be used in a final report. This can feel like an unproductive waste of time but is actually a normal and essential part of exploratory analysis. It helps you get to know the data set and provides important context for how you detect and present more interesting findings.

# Statistical Significance vs. Institutional Importance

Once you have identified differences or potential patterns using the exploratory techniques above, the logical next step is to determine if those differences are “big enough” to merit intervention. This is one of the most challenging parts of independent school IR because both institutional researchers and the consumers of their analyses often incorrectly conflate the meanings of “statistical significance” with “importance.” We offer the following explanation to clarify:

“Statistical significance” has a specific meaning that relates to scenarios when a researcher is working with a data set generated by a sample or subset of a larger population. The core question significance tests address is, “How confident are we that the result we are seeing in this sample represents a truth about the whole population vs. being the idiosyncratic result of the sample I happened to draw?” For example, imagine you were trying to determine the average height of students in your school. One way to go about this would be to pick a random sample of students, measure each one, and compute the sample average height. It is theoretically possible that because the sample was selected randomly, you happened to select all seniors (or basketball players, or other groups that happen to be taller than the typical student) leading to a sample average height far greater than the actual student population average height. Put simply, a significance test gives an estimate of how likely it is that the result you see in the sample reflects the whole population vs. a fluke produced by the students who were randomly selected into your sample (sampling variation.)

The first thing to notice is that significance tests only apply to situations where your data set comes from a random sample. In many projects in a school, we have access to data about the entire population of interest (for example, our data set of student course grades contains all of the grades issued by the school, not just a sample.) To continue the analogy above, we aren’t taking a sample of students to estimate the average height of all students; we know each student’s information so we can actually directly compute the true average for the entire student body. In these cases, questions of statistical significance are irrelevant and inappropriate.

## Speculation About the Future of Data Analysis and AI

There's been a lot of discussion about how AI will impact student learning and the teaching process in schools. AI will also have an enormous impact on how we do institutional research work. We anticipate that in the near future, an AI like ChatGPT will be able to connect to a data source and immediately produce an initial draft of a dashboard. AI will probably also soon be able to perform qualitative analysis on data sets containing open-ended survey responses, significantly lowering the time costs associated with thematic coding and sentiment analysis. These advances will almost certainly make the exploratory phase of analysis much easier and will eliminate the need for institutional researchers to know how to actually execute specific statistical techniques. We conjecture, however, that institutional researchers will

still need to curate AI output and recognize how to organize results into a narrative that is accessible for their specific users. In order to spot AI errors, institutional researchers will still need to know when certain visualizations or analysis techniques are and are not appropriate.

We are excited about developments in AI, but we did not feel confident recommending any specific AI tools just yet. There are too many open questions about how to connect AIs with a data set, about the accuracy of AI output, and about data privacy issues associated with feeding information about our constituents into an AI. CIRIS is watching this space closely and will be offering PD on emerging AI tools as the field continues to evolve.

Institutional researchers do work with data sets generated by samples; many parent/guardian or alumni surveys only yield a sample of a larger population. In these cases, significance tests could be appropriate. In order for a significance test to be valid, however, data sets have to meet specific conditions which many school data sets do not meet.


Lastly, even if a valid test does indicate that a difference is significant, it does NOT mean that the result is **important**. For example, a significance test might tell you that a difference between the average amount of time spent on homework each night by male and female students of 3 minutes is statistically significant. This does not, however, imply that this is an important issue for a school to address.

Furthermore, differences that are important may “fail” a significance test, especially if they involve smaller subsets of an overall population. One of the main determinants of whether or not an observed difference is

statistically significant is the sample size, with large sample sizes more likely to “pass.” Keeping an eye on DEIB priorities, this means that underrepresented groups are typically less likely to produce results that are statistically significant. To extend the example above, the same significance test that indicated that a 3 minute difference in average time spent on homework across gender IS significant might also indicate that an important difference of 15 minutes across smaller race/gender groups is not statistically significant.

We include information about a variety of significance tests in the table below, but we encourage schools to develop standards and criteria for determining if differences are “big enough” to address that do not depend on statistical significance. For example, after an initial study, school leaders can set goals for future results and monitor whether they are moving closer or further from the goal as time passes.

In summary: significance tests are complex to deploy correctly, but it is likely that a new institutional researcher can produce useful, practical results without ever using one and should not be deterred from starting because they are unfamiliar with the ins and outs of significance tests.

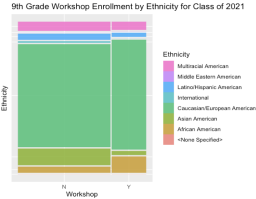


Data Analysis	Measures	Description
<p><b>Inferential analysis</b> applies statistical methods to draw conclusions about a population or a data generation process based on a representative sample drawn from that population.</p> <p> Know when you can and (more importantly) cannot use inferential analysis techniques.</p>	T-test (univariate quantitative data)	A t-test is a statistical hypothesis test used to determine if the mean value of a sample provides sufficient evidence to cast doubt on a belief about the value of the population mean. There are several conditions that need to be met in order to use this test with veracity. t-tests are often used when the variance of the population is unknown but the underlying population is known or assumed to be normally distributed. Also, t-tests may be applied if the sample size is sufficiently large.
	Z-test (univariate quantitative data)	Z-tests are similar to a t-tests but are appropriate when testing proportions (as opposed to means) and in the highly unlikely scenario where the population mean is unknown but the population standard deviation is known.
	ANOVA (univariate quantitative data)	Analysis of Variance (ANOVA) tests are used to compare the mean values of more than two samples. ANOVA assumes the samples are independent and the distribution of quantitative data within each sample comes from normally distributed distributions with equal variances.
	Chi-Squared test (categorical data)	Chi-Squared tests are used to compare observed sample proportions of categorical variables relative to expected proportions based on a known population or a sample from another population. A chi-squared test is a non-parametric test, meaning that there are no assumptions that the population data is Normally distributed. However, there are still underlying conditions that must be met such as mutually exclusive categories and sufficiently large expected cell frequencies.

## Data Analysis Platforms

Recognizing which analysis technique to deploy is just the first step. Next you have to actually do it. This is where data analysis platforms and packages come into play. Many platforms offer statistical analysis capabilities, and they are often packaged with data visualization functionalities. For further discussion of platforms and apps for data analysis and visualization, see the chapter on [Data Visualization](#).

## Data Analysis Case Studies

Here we offer three case studies that take a deeper dive into the specific analyses a school might do in order to provide insights for action.

Case Study	Description	Analysis Techniques
<p><a href="#">Assessing Efficacy of a Learning Support Program</a></p> 	<p>Data Academy offers an Academic Workshop course to incoming 9th grade students who may need support with broad student skills. The Academic Workshop teachers are curious about the following questions:</p> <ul style="list-style-type: none"> <li>• Which students are placed into Academic Workshop?</li> <li>• In what ways might Academic Workshop impact student achievement in their 9th grade courses and beyond? If the impact is positive, how might the Academic Workshop course be replicated for 6th grade students?</li> </ul>	<ul style="list-style-type: none"> <li>• Averages</li> <li>• Mosaic plots</li> <li>• Scatter plots</li> <li>• Tables</li> </ul>
<p><a href="#">Extending Traditional Metrics in Admissions</a></p> 	<p>At Data Academy, considerable Admission Office time and resources are devoted to its largest and most important Kindergarten entry point. The Admission team wants to pursue the following lines of inquiry:</p> <ul style="list-style-type: none"> <li>• What are the advantages and disadvantages of the current Kindergarten admission timeline?</li> <li>• What does the timing of when Kindergarten applications are received and the historical yield suggest about the Kindergarten applicant pool?</li> <li>• How can we maximize Admission and Communications efforts to engage families, capture market interest, and serve the school's broader enrollment strategies?</li> </ul>	<ul style="list-style-type: none"> <li>• Bar graphs</li> <li>• Combination graphs</li> <li>• Geo charts</li> <li>• Tables</li> </ul>
<p><a href="#">Comparing Grade Distributions</a></p> 	<p>It is the end of the quarter, and teachers have submitted all grades for their courses. The Academic Dean has received complaints from students and families that there are major differences in the ways that two teachers teach different sections of the same course. The Dean would like to:</p> <ul style="list-style-type: none"> <li>• investigate the claims made by students and better understand any differences that might exist.</li> <li>• better understand what the data generating process (DGP) is for a student's grade in the given course.</li> </ul>	<ul style="list-style-type: none"> <li>• Histograms</li> <li>• Segmented bar graphs</li> </ul>

## Conclusion

Statistics and analytical techniques can often seem like the most intimidating obstacles to starting an institutional research program. While mastering advanced statistics does take years of study and practice, schools can start analyzing data with the small and simple, yet powerful tools described in this chapter. There tends to be a lot of analytical “low hanging fruit” in schools that are straightforward to detect and leverage

early on. As research questions become more nuanced, an institutional researcher will likely need more advanced skills, but there is typically time to grow into these.

## FOR FURTHER READING

- [A University of Florida Biostats course with units on many of the topics discussed in this chapter. \(focus on SPSS and SAS\)](#)
- [A Princeton statistics resource that shows how to compute descriptive statistics and execute many of the techniques described here in Excel, Stata, and R](#)



# Data Visualization and Communication

## Overview

Data visualizations play an important role in packaging and presenting data. The old saying goes, “A picture is worth a thousand words.” This is certainly true. It can also be said that a bad picture will cost you a thousand words because you will need to explain it. In an ideal world of institutional research, a data visualization will need very little to no explanation and will help the user “see” trends and discrepancies in the data.

Visualizations (i.e. charts, graphs, tables, etc.) are a means for quickly and easily communicating information as they decrease the cognitive load on the viewer. Visualizations decrease cognitive load by harnessing the power of our visual system by utilizing certain attributes, such as length, width, size, shape, color, that can be processed and/or perceived in milliseconds before we pay attention to other things. When data is presented visually, it allows us to easily glean insights that would be difficult or impossible to piece together from the same data presented textually, as we are able to search and understand patterns and relationships among values and make comparisons that involve more than just two values at a time.

Knowing your audience will help you determine how you will communicate data insights and how much support, guidance, and scaffolding will need to be provided.

In this chapter, we will cover:

- Data visualization platforms
- Choosing the right visualization
- Designing dashboards and reports
- Examples of bad vs. good design choices
- Access control and preserving anonymity
- Sharing data insights

### Cognitive Load

The relative demand imposed by a particular task, in terms of mental resources required. (APA Dictionary of Psychology)

# Data Visualization Platforms

The first choice a school needs to make about data visualizations is which platform(s) to use. All visualization platforms have their own set of advantages and drawbacks. Capabilities, ease of use, cost, and the type of research project will all factor into which platforms you opt to use. Additionally, some platforms offer the ability to sync with data sources while others require manual updates.

That being said, the types of visualizations an institutional researcher chooses to present and the platform(s) they use to produce them are inherently tied to the overall data maturity of the school community and audience. Many times, the complexity or level of detail that is appropriate for any given report hinges much more on the data literacy of the audience rather than the capabilities of the researcher. When a school is new to IR, basic platforms like Google Sheets, Excel, and static slide decks are perfectly adequate to produce the types of visualizations and reports that a community can meaningfully interpret.

As a community's Data Culture grows over time and the audience starts asking more nuanced questions, institutional researchers may want to transition to more complex visualizations or more specialized platforms like Google Looker Studio, MS Power BI, or Tableau. These platforms can generate richer types of graphs and displays and enable the audience to explore and interact with data more independently.

Ultimately, an institutional researcher may want to be able to create fully customized types of displays that are not available in the templates provided in standard platforms. This is when programming languages like R or SPSS can become relevant.

For schools that are looking to start an institutional research program, the important takeaway here is that you do not need to invest in the “top of the line” most powerful platforms at the beginning of your program; they are in fact probably too powerful for school communities that are beginning their data journey. If you are a Google school, Google Forms, Sheets, and Looker Studio are a good (and free!) place to start. If you are a Microsoft school, Excel and Power BI are good starting options. The table below gives details on various options.

Platform	Cost	Description and Uses
Google Sheets	Free	Google Sheets (aka Sheets) is a free, online spreadsheet that lets the user easily share and collaborate in real time. It has all of the basic functionality of a spreadsheet application like Excel, including some plug-ins like XLMiner to do more advanced statistical analysis (and histograms). Sheets has a variety of visualizations available, including bar charts, scatter plots, and geo charts (maps). Spreadsheets are a good environment for cleaning data. Sheets partners well with (no surprise, here) Google Looker Studio.
Excel	\$	Excel is a desktop spreadsheet application that is often bundled on educators' laptops with the rest of the Microsoft suite. It is slightly more robust than Sheets, with more built-in analysis tools and types of visualizations (like histograms). It has some sharing functionality via Microsoft OneDrive but it is not as easy to collaborate as it is with Sheets. There is an online version of Excel packaged with Microsoft 365 but it has limited functionality. Excel plays nicely with Power BI.
Google Looker Studio	Free	Google Looker Studio is an online visualization platform specifically for creating interactive dashboards which are easy to share with colleagues. The interactivity allows the user to filter data by category with the connected visualizations dynamically updating in real time. Options for visualizations include tables and charts such as bar graphs, scatter plots, heat maps, gauges and tallies, and geo charts. There are add-on visualizations freely available such as metric funnels and sunburst charts. Google Looker Studio does not lend itself to easily manipulating, modifying, or cleaning your data, nor does it readily support visualizations like histograms or boxplots.
Power BI	\$\$*	Google Sheets is to Google Looker Studio as Excel is to Power BI. Power BI is a desktop platform in which you can create dynamic dashboards and reports to help illuminate data insights. Power BI is not easily compatible with Mac OS.
Tableau	\$\$\$	Tableau is arguably the most robust visualization platform available and is used by enormous Fortune 500 companies. It comes with an array of some of the coolest visualizations out there. It also serves as a "one stop shop" for cleaning and prepping your data. It is an expensive platform and the learning curve can be steep at the start. While Tableau can generate rich visualizations, many of them might be difficult to decipher for end users, especially if they are just starting to build their data literacy. We feel it is best for schools just entering IR to start with the Microsoft or Google products listed above and wait to consider Tableau until the IR program and the school's data culture have matured for a number of years.
Python, R, and SAS	Free	For those who code and want ultimate control, Python and R offer flexibility in analyzing large data sets in a repeatable, reproducible manner. A lot of work goes into getting the code just right, but once you get it where you want you can repeat the analysis and create the visualization with one keystroke. The types of visualizations are vast, powered by libraries that offer customizable charts and graphs such as plotly, seaborn, and dash (Python) and ggplot and shiny (R). There are also libraries that allow you to perform sentiment analysis of qualitative data.

Platform	Cost	Description and Uses
JMP, SPSS, and STATA	\$\$	For a “low code” option with a more user-friendly interface, JMP, SPSS, and STATA offer a rich array of statistical analysis tools and visualization options. These platforms provide the ability to clean your data and automate workflows for repeatable and reproducible analyses.
Google Forms	Free	Google Forms collects data and provides its own built-in visualizations for the results (pie charts and bar graphs). Of course, you can also link the data to automatically feed a Google Sheet for more extensive analysis. Google Forms also collect qualitative data which can be copied to a Google Doc and then coded and grouped for themes using a tool such as the Highlight Tool.
Qualtrics	\$\$\$*	Qualtrics is the “gold standard” in survey design and analysis for the user experience. The pricing comes at different tiers with different functionality. Qualtrics allows many different options of survey question types and offers the ability to make dashboards and do text analysis with your data.
Canva	\$*	Canva is an online graphical design tool that can be used to create polished data summaries with infographics and flexible layout options. Think of it as a blank canvas on which you can combine text, shapes, and graphics.
Lucid, OmniGraffle, and Visio	\$*	These platforms all excel at creating visualizations for flowcharts and processes.

\* some platforms offer a free version with limited functionality

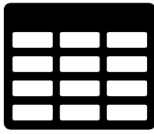
## Choosing the Right Visualization

Every report or dashboard revolves around presenting a series of individual visualizations that should create a coherent narrative for the user. The first step to creating the narrative is to choose the appropriate type of visualization for the data you are presenting, a process that begins by determining the type of data you are working with. Different types of data lend themselves to certain types of visualizations, and we offer the table below to aid in selecting the most appropriate chart or graph:

## Visualization

## Description and Uses

## Tables

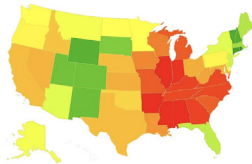


- Use with mixed audiences whose members will look for their own area or row of interest and when exact numbers are needed for comparisons

## Caution:

- ⚠ Tables interact with our verbal system rather than our visual system and thus increase cognitive load
- ⚠ Keep design secondary to the data; allow the data to stand out rather than borders and shading.

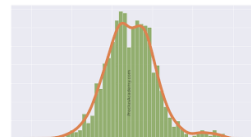
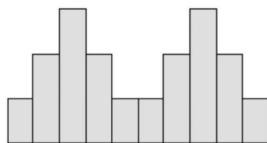
## Heatmaps



- Heatmaps are tables that combine the detail of a table with the visual impact added by color or shading
- Use heatmaps to decrease the cognitive load of a table

- ⚠ Consider the choice of color palette when designing a heatmap. Using a color gradient that covers too small a spectrum of colors can make reading a heatmap difficult.
- ⚠ Use diverging/converging color palettes judiciously. For instance, diverging color palettes are useful when representing data that ranges from negative to positive where converging color palettes might be useful for representing intensity.

## Histograms

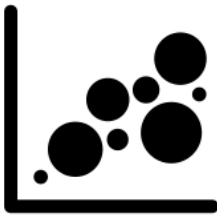
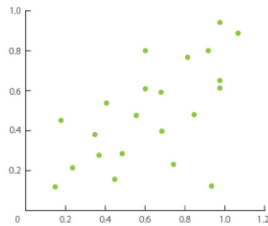


- Column and line histograms show distributions for a single variable.
- Use column histograms when there are few data points
- Use line histograms when there are many data points
- ⚠ Be aware of the bin widths that you choose so as to appropriately show the general pattern of the distribution.

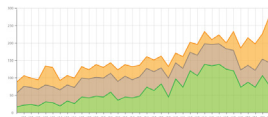
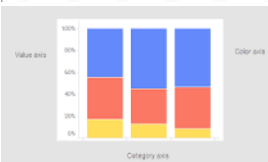
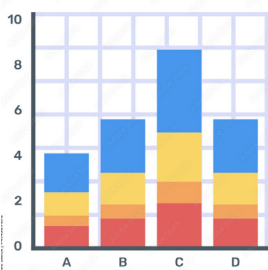
## Visualization

## Description and Uses

## Scatter and Bubble plots



- Show both distribution and relationship between two quantitative variables
- Bubble charts add a third variable to scatter plots indicated by size of the bubble

Stacked Column and  
Stacked Area Charts

- Stacked charts include subgroups of data
- Use when desiring quick approximations of both relative and absolute differences between subgroups
- Use stacked columns when showing the composition of subgroups or over few periods
- Use stacked area charts when showing the composition of subgroups over many periods
- Use stacked 100% charts when only showing relative differences
- A special sub-category of stacked bar charts is the offset, or diverging, stacked bar chart. [Here is a straightforward way to create diverging stacked bar charts using a spreadsheet.](#)

Caution:

- ⚠ Limit the number of subgroups to 5 or fewer.

## Visualization

## Description and Uses

### Pie and Donut Charts

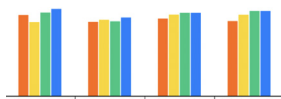
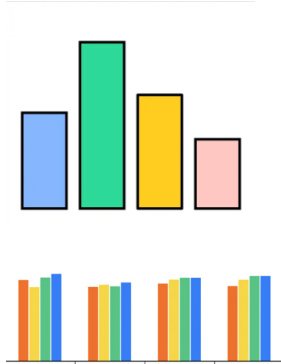


- Use when showing share of total and drawing attention to proportions in broad strokes
- Best used only when highlighting significant disparities between 2-3 categories.

Caution:

- ⚠ Estimates of magnitude based on angle sizes are inaccurate. Bar charts are a better choice when encouraging detailed analysis.

### Bar and Column Charts

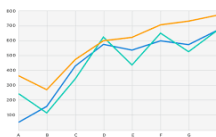


- Column charts compare data vertically; bar charts compare data horizontally
- Good choice for comparison because length is a salient preattentive feature and we are good at accurately gauging differences in magnitude that are encoded by length differences

Caution:

- ⚠ The axis must start at zero; length comparisons are accurately interpreted only when bars start at zero.
- ⚠ Limit the number of categories being compared in clustered charts to 3-5. Clustered bar charts can quickly become unintelligible for users
- ⚠ Limit the number of overall bars visible in a single chart
- ⚠ Labels should not be rotated. They should be readable left to right.
- ⚠ Never use three-dimensional graphics; they distort interpretation and add to cognitive load.
- ⚠ Use data labels or axis labels, not both.

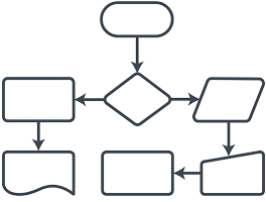
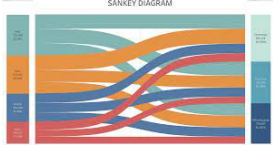
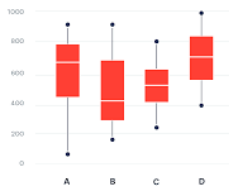
### Line Charts



- Good choice when comparing few or many categories over time

Caution:

- ⚠ When lines overlap a lot, interpretation is difficult. Consider strategies such as emphasizing just one line at a time or separating the lines out within the same graph or in different graphs.

Visualization	Description and Uses
<p>Flow Charts</p> 	<ul style="list-style-type: none"> <li>• Good for data mapping and representing and documenting process flows and relationships among components</li> </ul> <p>Caution:</p> <ul style="list-style-type: none"> <li>⚠ Start from left to right when documenting flows</li> <li>⚠ Limit the number of components included; consider breaking complex flows into multiple charts</li> <li>⚠ All components included should fit on the same page</li> </ul>
<p>Sankey Diagrams</p> 	<ul style="list-style-type: none"> <li>• Aids in the visualization of how one categorical variable “flows” into another.</li> </ul> <p>Caution:</p> <ul style="list-style-type: none"> <li>⚠ Limit the number of components considered</li> <li>⚠ Advanced visualization that is not easily built in many platforms</li> </ul>
<p>Boxplots</p> 	<ul style="list-style-type: none"> <li>• Easily conveys the center and spread of a data set.</li> <li>• Boxplots are segmented into two inner “boxes” and two “whiskers” (which is why box plots are also known as box-and-whisker plots), with each segment representing 25% of the data values.</li> </ul> <p>Caution:</p> <ul style="list-style-type: none"> <li>⚠ Two different data sets with different distributions can possibly be visualized with the same boxplot, masking the full distribution of the dataset.</li> </ul>

## Designing Dashboards and Reports

Reports and dashboards rarely consist of a single visualization. You are typically presenting a number of visualizations and other information. As an institutional researcher builds these sections, they make decisions about how many visualizations to include, how big they should be on the screen, which colors to use, where to place filters and other interactive elements, and how much explanatory text to include. The guiding principle in all of these choices is always to present your data narrative clearly while minimizing the cognitive load experienced by your end users.

The following tips will help institutional researchers achieve this objective:

- Know the data story you are trying to tell. By the time you are making a dashboard, you will have computed many descriptive statistics and created many visualizations, most of which won't reveal any particularly



interesting insights and will end up “on the cutting room floor.” A few, however, will be compelling, and you want to center your dashboard or report on highlighting these notable results in a cohesive narrative. Before you start building, make sure your vision of this narrative is clear.

- Know your audience. The most common design error institutional researchers fall into is building reports and dashboards that they themselves find interesting but that overwhelm users. An institutional researcher with high levels of data literacy might, for example, instantly recognize boxplots and be able to immediately derive a message from the display. An end user just starting to develop their data literacy skills may need to expend considerable mental energy just to know how to read the boxplot before being able to interpret its meaning. Choose the simplest visualizations you can to convey the meaning of the data.
- Unless you’ve done intentional explanatory analysis, your goal for the dashboard or report should be to present patterns you’ve found without necessarily making a claim about why they exist. It is useful to list a few possibilities that, alone or in combination, might be driving the pattern, as well as a few dynamics that could not possibly be driving the pattern (if these are obvious.)
- Dashboards and reports can evolve. Restrain yourself from adding every possible bell and whistle when your school’s Data Culture is in its infancy. Over time, your users will build data literacy and start asking more complex questions. At that point, you can add new visualizations and functionalities to the dashboard. This is one reason why having the institutional researcher present in meetings where dashboard users are discussing results is so important.
- Relatedly, especially when building dashboards that will be in use for many years, design the dashboard as if users are viewing it for the first time each time they access it. Because of staff turnover, the dashboard will have new users even if the dashboard has been in use for years. This means including “helper text” in each section to explain how to read the visualizations and/or use interactive elements. Alternatively, you might consider including a “How to use this dashboard” section in the dashboard itself.
- Adopt consistent formats within a single dashboard and across all dashboards you create at the school. These might include styling practices like including your school’s logo in the upper right corner

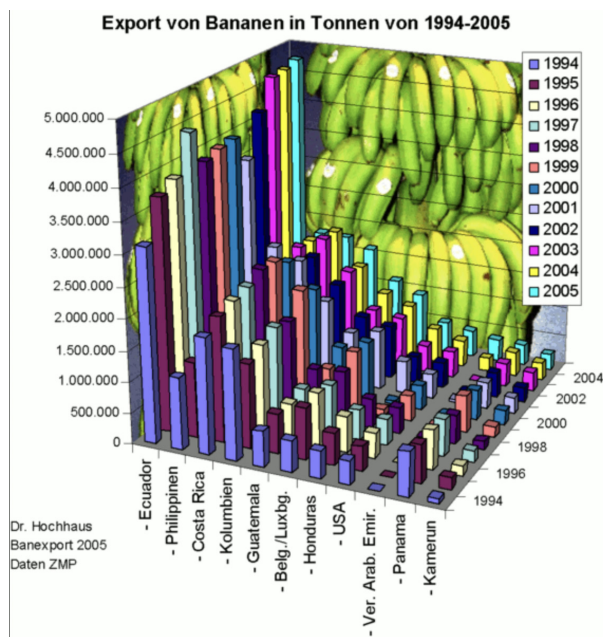
of each page, always arranging filters horizontally across the top of each page, standardizing font and color choices to integrate with your school's style guidelines.

- Order visualizations by importance, top to bottom and left to right.
- Strategically use preattentive attributes like color, size, and length to focus attention
- On the topic of color choice: Use color sparingly and consistently. Color, when used, should convey meaning, using the minimum number of colors needed across the dashboard. Make sure your color choices conform to accessibility standards.
- Minimize clutter and use white space. When a user opens a dashboard page with 15 visualizations on it with no white space between them, they will become immediately overwhelmed (and possibly just close the dashboard).
- Visualizations should be titled and labeled, but not redundantly so. For example, include data labels or axis labels but not both. Consider whether elements like gridlines are needed to read the graph or if they merely increase clutter.

There are many excellent books and online resources that go into detail about graphic design principles for data storytellers. Several of the editors of this guidebook found *Data Story* by Nancy Duarte informative and useful. We would also be remiss if we did not mention Edward Tufte's *The Visual Display of Quantitative Information*, an iconic reference first published in 1983. Additional resources appear at the end of the chapter.

# Examples of Bad vs. Good Design Choices

## A BAD INDIVIDUAL GRAPH: NAUGHTY BANANAS

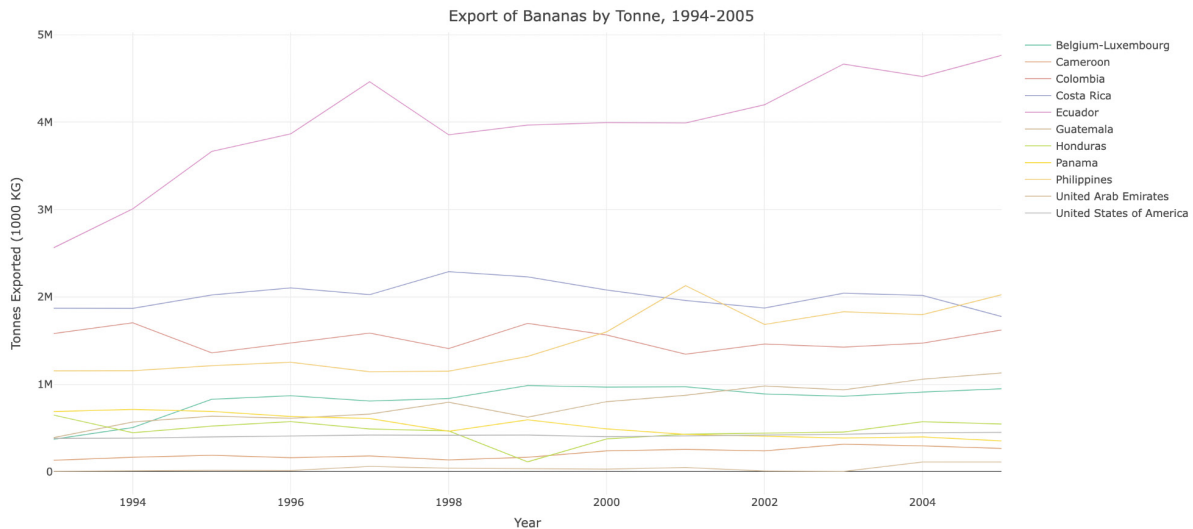


This graph of banana exports from various countries is terrible from a design perspective for the following reasons:

- Most people don't know how to begin reading this graph. If we try to follow our natural inclination to read from left to right, we just see a list of country names that are in no discernible order.
- Graphs with three axes are a challenge for most people to interpret.
- The way years are displayed is redundant: they are represented both on an axis and by colors (and the colors seem to be randomly chosen without any meaning).
- Many of the columns are visually distant from the vertical axis making it nearly impossible to read what value they represent. Furthermore, in order to read values, the user must imagine grid lines that slope down and to the right from the vertical axis.

- The banana image plastered to the “walls” of the graph adds no value and substantially increases the visual clutter of the graph.

## A BETTER BANANA GRAPH:

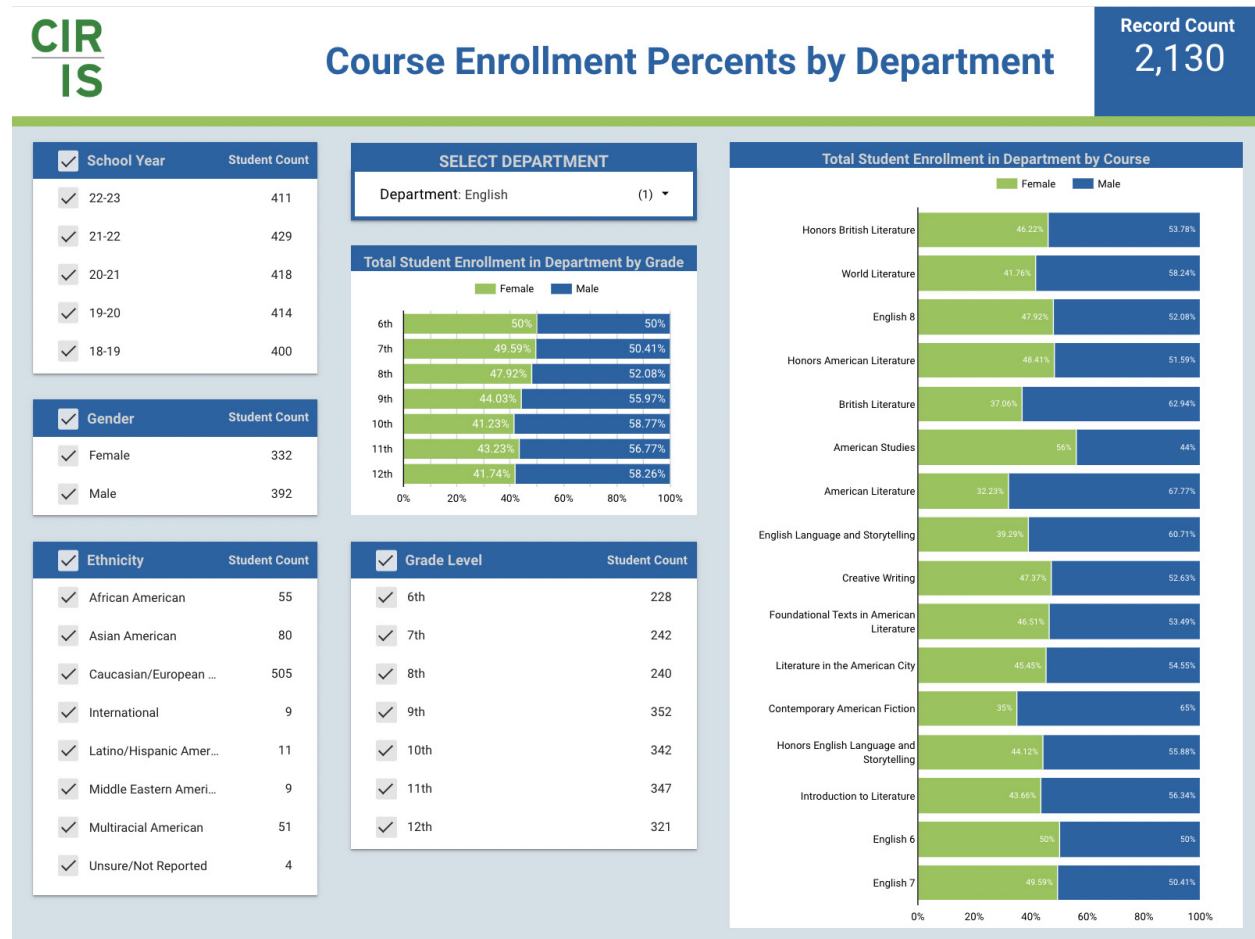


This version of the graph communicates the same data but it:

- Leverages our innate habit of reading from left to right to intuitively communicate chronology, and years are only represented by a single signifier (the horizontal axis)
- Color is used to convey a meaning (country)
- The magnitude of interest (tons of bananas) harnesses our implicit understanding of “higher means more” elegantly. The rectangular columns in the previous graph cluttered the space when we really only care about where the top of each column was.
- Deleting the image of bananas allows the user to actually read data values

# An Example of a Dashboard Page

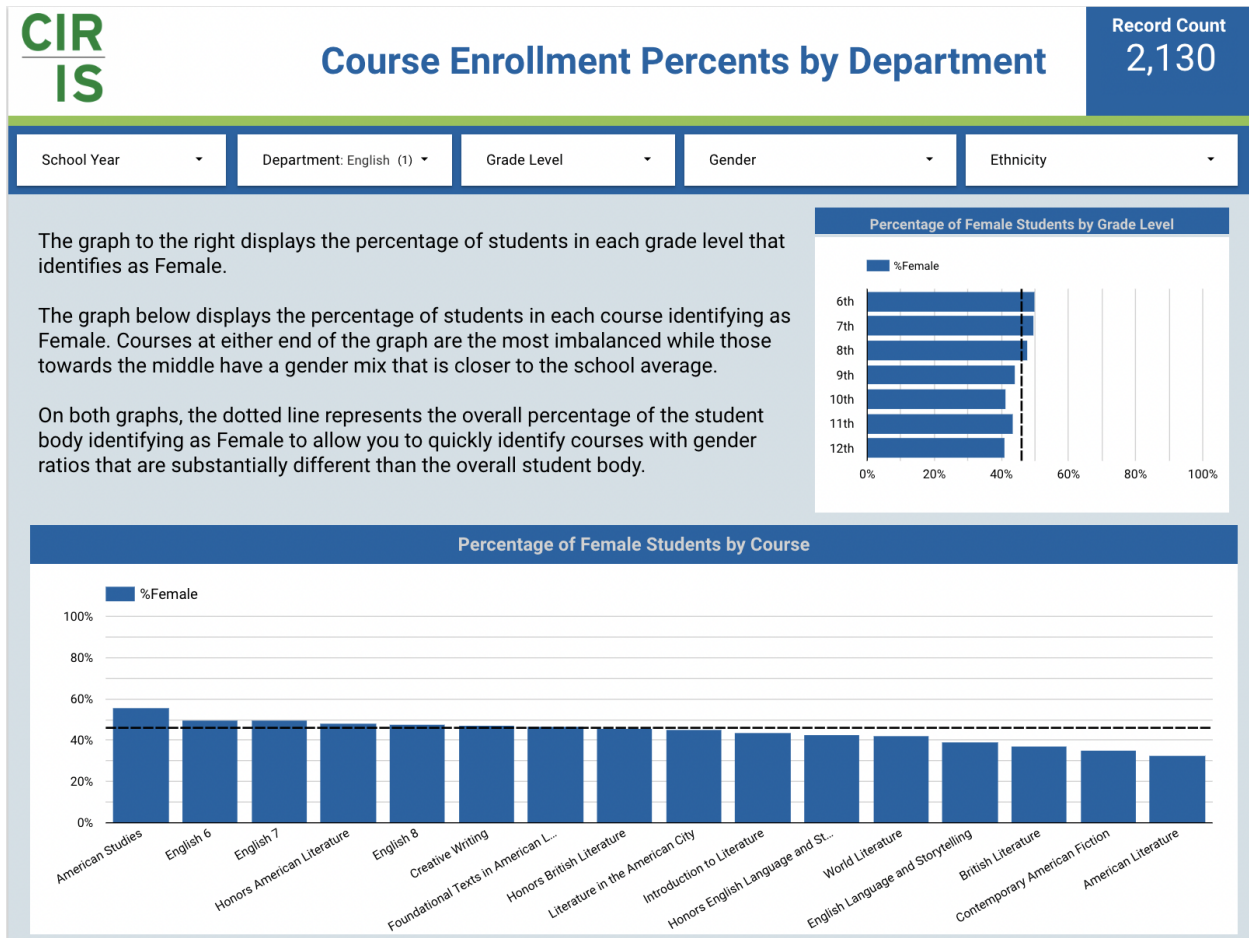
The dashboard page below is a mock up using fictionalized data with the goal of helping academic leaders detect gender imbalances in different courses across the school.



This dashboard page exhibits many excellent design principles:

- Simple color palette
- Plenty of white space
- Interactive filter controls consistently placed on the left side of the page
- Segmented bar graphs are easy to interpret

One aspect of this dashboard we could improve on, however, is in decluttering:



- By changing the filters to drop down menus instead of static lists, we freed up a lot of real estate on the page allowing for the inclusion of some help text
- The original version’s segmented bar graphs showed only two categories (male and female) that added up to 100%. The same information can be communicated by only showing one category or the other (we arbitrarily chose to display the percentage of students identifying as Female.)
- We added a sort to the course listing so that users will immediately see which courses have the most disproportionate gender ratios
- Including a dotted reference line to the graphs informs users of the school-wide gender breakdown. This prevents users from having to know or assume this value on their own.

# Access Control and Preserving Anonymity

Many times, a single dashboard will have multiple users who should not all have permission to view all results. In the example dashboard above, data for all departments is available for users with unrestricted access. However, many dashboarding platforms allow the dashboard creator to build in access controls, often based on the end user's email address. In our example, these permissions could be set so that an Assistant Head of School would see all courses the school offers while the screenshot above might be what the English department chair sees when they open the dashboard (only English courses.) For an interactive tutorial on how to implement access control in Google Looker Studio, please see [the recording of the 2023 CIRIS PLG meeting](#) on this topic.

A final consideration in building dashboards is to preserve anonymity when needed. Institutional researchers can accidentally compromise anonymity by allowing the unrestricted application of the interactive filters available to users. Without precautions, a user could simultaneously filter by gender, race, and grade level, leading to the display of results for a group of one or two easily identifiable individuals. This both compromises anonymity and shows the user results that are based on too few individuals to draw any meaningful conclusions. To avoid this, the dashboard creator can put limits on the interactive elements available to the user so that they will stop offering filtering options once the sub-group goes below a certain size (perhaps 10 individuals.) Hard coding these record count filters gives users flexibility while also maintaining the integrity of promised anonymity.

## Conclusion

At its heart, data visualization is about storytelling. All of the choices an institutional researcher makes in selecting charts and graphs to include in a dashboard or report are driven by the goal of presenting a full story with minimal distractions. To accomplish this, an institutional researcher needs to have a clear vision of what the story is and to select the visualizations and explanations that present that story to users in a way that is accessible to their level of data literacy. We hope this chapter provides you with tools to achieve these goals.

## REFERENCES

- [Storytelling with Data](#), Cole Nussbaumer Knaflic
- [Now You See It \(2020\)](#), Stephen Few
- [The Big Book of Dashboards](#), Steve Wexler, Jeffrey Shaffer, Andy Cotgreave
- [Visualization types | Data Visualization Standards](#)
- [Chart Suggestions—A Thought-Starter](#)
- [How to Design a Flowchart | Lucidchart Blog](#)

## FOR FURTHER READING:

- [Visual Vocabulary](#)
- [How to Choose the Right Colors for Data Visualizations | by Marie Lefevre](#)
- [choosing colors for data visualization](#)
- [ColorBrewer](#)

*The independent schools investing in comprehensive institutional research have a profound understanding of not only what makes their school communities tick, but also a contemporary view of their schools' DNA. The thought leaders in our space are willing to challenge assumptions and dig deep into the data for meaning. That's where the magic of institutional research lies.*

— CHRISTINA LEWELLEN, MBA,  
CAE. EXECUTIVE DIRECTOR, ASSOCIATION OF TECHNOLOGY  
LEADERS IN INDEPENDENT SCHOOLS