# Developing a Data-Informed Campus Culture: Opportunities and Guidance for Institutional Data Use

By: Monica Maldonado, Konrad Mugglestone, and Amanda Janice Roberson

## Executive Summary

At a time when increased degree completion matters not just to institutions but also to state governments seeking to meet workforce demands and attainment goals, institutions use high-quality data to help them get students across the finish line. The impact of the COVID-19 pandemic on postsecondary education cannot be understated. Institutions and states are facing the same goals with smaller budgets and the potential for a prolonged recession. Black, Latinx, Indigenous, underrepresented AAPI, and students from low-income backgrounds have borne the brunt of economic shocks in higher education.[1] As a result, recent research shows they may be more at risk of stop out or drop out in the coming year.[2]

Information derived from high-quality data allows institutions to develop interventions that ensure the equitable success of students, especially during a crisis that has disproportionately impacted the very students who have been historically excluded from higher education. In fact, the work of institutions to identify and close gaps in access and completion is more important than ever. In this brief, we outline recommendations from campus representatives about how to build a data-informed institutional culture to equitably improve student success. These recommendations also address how institutions can implement data-informed decision-making and foster the collaborative use of data.

We convened 28 institutional teams from a diverse array of sectors at the IHEP-AIR Interactive Policy Summit in August 2019 to discuss how to build a data-informed culture and find solutions to the challenges they face in data use. Throughout the meeting, participants completed workbooks, capturing their data challenges, reflections, and takeaways. After reviewing these workbooks, IHEP identified six institutions, representing a variety of sectors and backgrounds, to participate in follow-up interviews.

These workbooks and interviews informed five recommendations for creating a stronger, more equity-centered data culture. Taken together, these solutions will benefit any institution hoping to build and improve its campus data climate:

1. **Identify champions among leadership and across campus to establish a data culture and increase data literacy.**
   While supportive leadership is essential for driving change, building consensus around data use requires finding individuals across campus roles who can exemplify the value of data and excite their colleagues to be data-informed.

2. **Strengthen data literacy among all campus stakeholders.**
   Making data widely accessible is useful, but institutions must develop a training plan to augment the ability and capacity of various campus stakeholders. Knowing what training to provide requires an in-house examination to determine data literacy needs.

3. **Establish unified metrics across offices and a data dictionary to standardize definitions, streamline analysis, and improve data literacy.**
   Using data strategically requires campuses to assess current data collection, agree on a set of metrics, and distribute the parameters widely.

4. **Develop partnerships to streamline data processes, including synthesis and governance.**
   Collaboration is key to efficient data collection and use. This includes breaking down silos within the institution and could involve making use of external sources of data. Building relationships within and beyond the campus lets institutions learn from each other.

5. **Invest time and resources in access to and use of high-quality data on campus.**
   Data collection and analysis both depend on increased capacity. Hiring and training staff is essential for creating a strong data campus culture. Institutions should give adequate time to build the data literacy and culture and successfully implement change.

**Introduction**

In recent years, states, colleges, and universities have increasingly discovered the power of data and its capacity to drive institutional improvement and better outcomes, especially for students from low-income backgrounds and Black, Latinx, Indigenous, and underrepresented AAPI students. Without data, institutions are fumbling for a light switch in a dark room, trying but failing to fully identify longstanding racial and socioeconomic inequities or implementing ineffective solutions. High-quality data can provide a spotlight, illuminating inequities and allowing for precise policy reactions to close existing gaps. There are myriad examples of institutions taking these steps.

Take, for instance, California State University, Fullerton, which developed a dashboard connected to a data warehouse that has allowed advisors to pinpoint students who may need additional supports to reach an on-time graduation.[3] In another case, the City University of New York staff used data to understand the impact of higher course loads on retention rates and to create programs to encourage students to take more credits hours early in their college careers.[4]

**In this brief, informed and inspired by such examples, we outline recommendations from cross-functional campus representatives for how to build a data-informed institutional culture to equitably improve student success.** These recommendations also address how institutions can overcome challenges in implementing data-informed decision-making and recognize the collaborative nature of developing data use.

The need to understand how to use data to better serve students has never been more pressing. Because of COVID-19, institutions and states are looking for ways to safely and effectively teach students online or through hybrid models, and are facing smaller budgets, uncertain enrollment, and the potential for a prolonged recession. Black, Latinx, Indigenous, underrepresented AAPI, and students from low-income backgrounds have borne the brunt of economic shocks, and research shows they may be more at risk of stop out or drop out this year and in the semesters ahead.[5] It is essential that state and institution leaders use their available data to ensure they continue to equitably serve students in the midst of this crisis and beyond.

The building blocks for these data-informed campuses and cultures already exist. Institutions recognize the importance of both quantitative and qualitative data, and when asked, institutional representatives broadly agree on what a "data-informed" campus looks like.[6] For instance, the University of Illinois at Chicago defines a data-informed campus as one that has "alignment, collaboration, communication, and a student success-orientation." Similarly, Lehman College (City University of New York) considers a data-informed campus as one where various on-campus stakeholders are complementary, each participant highlighting different insights that are all geared toward taking action.

Administrators and academic leaders see data as not only a source of information but also a tool for driving change, and they acknowledge that data functions differently across roles and departments. However, while numerous institutions want to build a data-informed culture and agree on what that culture looks like, many are struggling to develop it.

So how are institutions approaching this challenge? What difficulties are they facing, and what are the solutions? To answer these questions, the Institute for Higher Education Policy (IHEP) convened 28 institutional teams from varying institutional types, sectors, and levels at the IHEP-AIR Interactive Policy

Summit to discuss their experiences and challenges with building a data-informed culture and find solutions to the barriers they are facing in doing so.[*]

The summit provided an opportunity for institutions to build relationships within their campus team and with institutions across the country. It also helped IHEP identify the ways in which institutions are both struggling and succeeding with data. Throughout the meeting, participants completed and submitted workbooks, which captured their data challenges, reflections, and takeaways. Alongside these workbooks, IHEP identified seven institutions, representing a broad variety of sectors, to participate in follow-up interviews (see Appendix for full list of schools and interviewees). Taken together, these sources illuminate the variety of approaches and creative solutions that institutions have developed to use data effectively on campus.

Overwhelmingly, during the summit and in the interviews, institutional teams realized that they are not the only ones facing data challenges. Rather, these challenges are remarkably similar, despite differences in institution size, level, and sector. Bringing these teams together provided affirmation for those diligently working to implement change and allowed for fruitful discussion. The following five solutions for creating a stronger data-informed culture are based on what we heard in the conference and our interviews. We also encourage institutions to foster dialogues where alternative solutions can be brainstormed, developed, and implemented to fit the specific circumstances of each campus.

**1. Identify champions among leadership and across campus to establish a data culture and increase data literacy.**

Institution leaders play a critical role in laying the groundwork for a data-informed campus culture. At some institutions, the desire to expand data use has existed for years. However, the impetus and opportunity to create change comes when campus or state leaders become advocates for harnessing the power of data to identify interventions to increase student success. For example, Missouri's Department of Higher Education and Workforce Development (MO-DHEWD) Director of Academic Research, Erik Anderson, explains that leadership's decision to prioritize data use provided the support to focus on what the data has to offer:

> "We had been talking for years about how to address equity issues and gaps in the state of Missouri and about what form would that take. [But] at the end of 2018, Commissioner Mulligan said, 'Let's really make this a priority and move this forward.' She gave us the time and space we needed to really delve into this deeper than we ever had before."[7]

But data leadership does not *have* to come from the top. Many campuses have found data ambassadors across departments at all levels. Finding representatives to champion data use in their respective roles and departments helps to increase faculty and staff buy-in across campus. In fact, institutions that have already developed data ambassadors share that they are highly successful for getting those beyond the institutional research office also excited about data.[8] Reflecting on lessons learned from the summit,

---

[*] The Association for Institutional Research (AIR) was IHEP's partner in this meeting, which was held in Minneapolis, MN on August 1 and 2, 2019.

These institutional teams, of four members each, were selected through an application process. Since the development of a data-informed campus is not the responsibility of one department nor is it possible without cross-campus collaboration, IHEP's reviewers looked for teams that included cross-functional representatives. These representatives drew from executive leadership; institutional research; information technology; government relations; and other areas that use and produce data, like enrollment management.

Diane Vickrey, director of institutional research at the Maine Community College System (MCCS), elaborates on this recommendation:

> "Someone talked about a data ambassador and we said, 'Oh, what a good idea.' Because it's really all about changing the culture and you have to get the people who are really excited about data and make them ambassadors. I think that's the way you can start changing your culture."[9]

By showcasing how they have leveraged the power of data, data champions can, over time, help others to build confidence in data and use it to support students. In the case of the University of Nebraska–Lincoln, the institutional research team initially faced some resistance when implementing a campus survey that linked student responses to respective units on campus to identify areas of concern and work towards solutions. Yet, said Dr. Amy Goodburn, the senior associate vice chancellor and dean of undergraduate education, "once they saw the data that we were seeing, it clearly showed needs that they hadn't been thinking about and got them really excited about what they could do next. Now, everybody wants to be involved."[10] Put another way: seeing how institutions, offices, and departments can better serve students with new or already available information creates momentum for those who are skeptical about using data.

> **Sidebox 1: Accessibility of data**
>
> A tangible step toward inspiring excitement about data and building literacy among data ambassadors and champions is to make this information accessible through standardized dashboards and visuals. Providing user-friendly dashboards specific to the needs of each department on campus ensures that everyone can use the data most appropriate for their position and needs and recognizes that data are used differently by people in different positions.
>
> Dr. Nic Richmond, chief strategy officer and vice chancellor of strategy, analytics and research for Pima Community College, described the "highly interactive" business intelligence (BI) system in place at the college: "We've got most student metrics in our BI system, if people want to see enrollment, persistence, grades, but we're also a [Voluntary Framework of Accountability] VFA school, so we have the VFA metrics in BI as well. People can log in, they can drill down to the level of individual courses and understand the demographics of students in a particular area or the program that they're taking. Are they low-income or first-generation? What high school did they come to us from? What are their grades looking like?"[11]
>
> These dashboards are a great opportunity to elevate the institution's focus on equity through disaggregated data and highlight opportunities for strategic and programmatic changes that support underserved students.
>
> At the University of Illinois at Chicago, Dr. Bernie Santarsiero explained that his team developed "an equity dashboard so that faculty have access to the data themselves. Faculty are able to create specific data pulls such as looking at the DFW [students earning a grade of D, F, or withdrawing] rates in a certain course in chemistry and looking at it by race/ethnicity.

With this tool, they are able to have more access to [the information], without actually having to contact an individual at institutional research to pull the data and help with the analysis."[12]

Though the availability of disaggregated data can illuminate areas of inequity and a need for strategic improvement, it is equally important to consider just how much to share and how to present it. Richmond offers some insight on this: "We get a lot of input from faculty and others that there's an overwhelming amount of information….As a data person, I look at a table of numbers [and] say, 'Oh that's great'….But for people who aren't used to doing that, that can be a pretty intimidating thing to encounter. Good data visualization is important." [13] Making data accessible is a positive step, but institutional researchers must consider how to present it so that more individuals can effectively access and use it.

**2. Strengthen data literacy among all campus stakeholders.** Once data are in the hands of those who want to use it, how do they know how to analyze and make meaning of it? Overwhelmingly, institutions agree that increasing data literacy through training is essential to become a data-informed campus. This means ensuring that everyone is provided not only with the tools, but also the knowledge to help them make data-informed decisions. Dr. Nic Richmond from Pima put the challenge this way:

"Every employee has access to this interactive reporting system, but now we're trying to get people to really engage with it and actually use the data that's available to them. We have a couple of key users who use the system extensively, but we need to get the whole institution comfortable using this system."[14]

Determining how to build campus-wide data literacy requires an in-house assessment of current needs and institutional goals for data use. Based on this assessment, institutions can design and invest in training experiences that allow various stakeholders to strengthen literacy and analytic skills and enable them to use established data tools.

> **Sidebox 2: The Postsecondary Data GPS**
>
> Unsure where to start with basic data analysis and visualization? IHEP developed the Postsecondary Data GPS (available at datagps.ihep.org) as a free resource for institutions who are eager to begin using their data to uncover inequities and advance student success. Designed for use by data novices and statisticians alike, the GPS is an open access, easy-to-use tool for a variety of offices across campus to quickly transform aggregate data into useful visualizations that highlight trends in need of further exploration and to inform institutional change efforts.

Training can take many forms, and institutional leaders should employ the strategies appropriate to reach their desired audiences. For instance, data ambassadors can be a knowledgeable and familiar resource for others on campus and can help their peers to become more comfortable with data use. They might lead longer, more formal trainings for staff and faculty, like the analytics academy at Pima or, less formal workshops, such as the "Data Talks" implemented by the Massachusetts Institute of Technology (MIT).[15] Alex Wagner, director of institutional research in the office of the provost at Lesley University, raised MIT's "Data Talks" as an example because they are a great way to "get people to talk about: How do I actually

go about getting data? What does data actually mean? What are the pitfalls? What are the limitations? What are the privacy issues?"[16]

Conversations like these serve as essential pathways for increasing data literacy, weaving data into day-to-day campus conversations, and elevating data as part of strategic goal setting.

**3. Establish unified metrics across offices and a data dictionary to standardize definitions, streamline analysis, and improve data usability.**

In order to foster a collective understanding of data access and use across campus, standardization of data and metrics is essential. Interviewees and Policy Summit participants recommend meeting with representatives from across campus to illuminate areas of consensus and dissent around metrics and definitions, and to create a space for alignment. Vickrey from MCCS outlined the process her team uses in arriving at any data decision or definition:

> "We ask ourselves, 'what is it that we need?' As we're developing these dashboards and we're incorporating this data, we need to have data definitions, we need to have an agreement that this is the right thing to measure. 'This is how we measure it.' 'This is what we call it.'"[17]

Engaging stakeholders across campus offers an opportunity to identify gaps in metrics, agree on a unified approach to capturing data, and strategize long-term data goals. Jeremy Kintzel, director of data and research services at MO-DHEWD, stressed the value of these meetings, emphasizing:

> "It is so important to get all of your stakeholders, all of your data users on the same page in terms of the meaning of what they were looking at. It's not enough to present data. You've got to get unity around what the questions are and what the definitions are so people understand really at a deeper level what they're looking at and what we're trying to accomplish."[18]

University of Illinois at Chicago's director of research initiatives in the office of the vice provost for diversity, Bernie Santarsiero, agrees:

> "We've been more cognizant of the importance of institutional data and using it. Seeing what kind of data that we have in terms of [knowing] what our goals are, setting metrics and then seeing what data we've already assembled and seeing if we're missing data. So that's been an important part, thinking about what data do we really need, what data are we collecting."[19]

Institutions find that it is important to standardize and operationalize the data collection, definitions, and subsequent calculations to create a usable data dictionary.[20] Uniform collections using consistent definitions enhance data usability by providing a reference point, especially for novice data enthusiasts, on what the data mean and how to analyze it. This also ensures a standard of research practice that transcends the individual(s) leading data initiatives on campus, so that a culture and process is set in place to define how campus data is measured and assessed regardless of personnel shifts over time.

### Sidebox 3: Toward Convergence—The Metrics Framework

IHEP is dedicated to ensuring that metrics used in policy and practice are comprehensive, inclusive, consistent, and designed to uncover inequities. Built on over a decade's worth of research and data collection, our 2016 report, *Toward Convergence: A Technical Guide for the Postsecondary*

*Metrics Framework*, provides a framework and data definitions for institutions to apply in order to ensure data accurately reflect and serve the entirety of their student body.

**4. Develop partnerships to streamline data processes, including synthesis and governance.**

Institutional representatives identify the value of collaboration, both on and off campus, to develop and establish data governance processes. Bringing together individuals from various campus offices at the Interactive Policy Summit heightened their awareness of just how siloed their data systems can be. As noted by Vickrey from MCCS, "people are pretty hungry for data, but I think we have also some challenges because data is siloed."[21] The decentralization of data collection throughout the institution limits strategic data use by isolating useful information in existing systems, resulting in the duplication of collections as well as confusion about the source and intended use of data.[22]

Synthesizing existing campus data systems calls for everyone to communicate effectively, lay out what is available, and establish policies for data sharing. Kintzel from MO-DHEWD describes this process as:

> "The right people carving out time and space to talk and share and say, 'Hey, this is what we've got. This is what you've got. This is a strategic priority we've got. How can some of your data help us?'"

Goodburn from University of Nebraska–Lincoln, reports that gathering cross-campus representatives allowed their institution to work on "sharing all the data that we currently are collecting and is available to us and figuring out how to work strategically across those offices. This allows us to use data more effectively and to connect it with other data points that we may not have been aware of."

To ensure access to these combined data, some institutions build out a warehouse, as in the case of Pima. Richmond says, "we're working on the data warehouse side to integrate across all these data silos and have a single 'truth' for the institution. That's going to take some time for us to complete and we will need support from the college along with key data champions."[23]

Alternatively, data synthesis could lead to a restructuring within the institution itself, which has been the case for the University of Illinois at Chicago. Santarsiero says, "we still had a lot of different tents. And so there's been an effort to try to move everything under one tent. That's been a big effort probably for the last six months, of reorganizing some of the units…under one roof."[24]

As an additional benefit, Santarsiero points out how streamlining within the campus also alleviates the strain put on students through surveys:

> "We've formed a committee that's reviewing the policy for student surveys [and] just how we schedule those. What do we schedule that are things that we want to look at every year, every other year, and so on? It is overkill to students sometimes, when they'll get surveys from [various offices, colleges, and programs on campus], and so obviously the response rates aren't very good. If we're asking a lot of questions that we can use that others are interested in, there's a way we can package that a little bit better and have a little bit more control on that. We are putting together a set of policies so that we can actually get better results from the data that we do collect. And if somebody wants to create a new survey, there can be guidelines to do that."[25]

Beyond collaboration on campus, other institutions expressed interest in inter-agency data sharing or have benefitted from establishing partnerships outside of the institution. For instance, linking with early

high school data could be a means of improving student outcomes, as Richmond from Pima acknowledges: "There's a lot we don't know about our students when they're in high school and if we knew that we may be in a better position to be able to support them when they get to us."[26] Ultimately, building relationships and breaking down data silos is a function of collaboration: multiple stakeholders working together for the common goal of improving student success.

> **Sidebox 4: Change with Analytics**
>
> For years, the National Association of College and University Business Officers (NACUBO), EDUCAUSE, and the Association for Institutional Research (AIR) have hosted the Enterprise Summit, providing an opportunity for institutional leaders across campus offices to develop solutions for data analytics on campuses.[27] Furthering this understanding of the transformative power of data and collaboration, these three organizations also launched the *Change With Analytics* initiative, an effort designed to help leaders to integrate data-informed decision making.[28] The [initiative's website](#) offers resources, such as case studies, and recommendations for how to build out data analytics on a campus.[29]

Regardless of how data is housed on campus, it is essential that institutions think through data access policies and student privacy concerns. Goodburn from University of Nebraska–Lincoln points out that institutions need to consider "who has access to what data and how we can balance the interests of student privacy and instructor privacy with our overall goals for degree completion and student success initiatives. It is essential to advance some clear and transparent policies around that."[30]

## 5. Invest time and resources in access to and use of high-quality data on campus.

As institutions undertake more fulsome efforts to use data to transform their campuses, they need to expand the resources devoted to data collection, management, and analysis. Unfortunately, as these data demands have grown, investment in institutional research teams has not necessarily kept pace. Further, as institutions and states see budget cuts in the wake of COVID-19 and the associated recession, some may be tempted to deprioritize these critical investments. And yet, when institutional representatives are asked what they need in order to move forward with their long-term data goals, they resoundingly agree that increasing their data analytics staff could help them to adequately address all of the data requests they receive while also advancing data use to better serve students. Barbara Conner, the dean of student success and enrollment management at Southern Maine Community College (SMCC), describes the challenge:

> "One element that is a barrier is time. Having time to just sit and work on the data when you have everything else going on is very, very difficult because we don't have a data analyst, which makes it even more difficult."[31]

Goodburn from University of Nebraska–Lincoln reiterates this need:

> "We need people to do the work. I need somebody to just be able to do [data analysis] two days a week because I don't have the time to be analyzing numbers all the time. If I had a team, it would be even better."[32]

Institutional participants at the Policy Summit agreed that "data is labor intensive" and on the fact that they need to help others understand "the difficulty, time, and cost of collecting data."[33] Because of this, it is important for leadership to prioritize which data to collect and analyze. Conner from SMCC states:

> "We've decided that giving data up for the sake of getting data out is not our intent. We want to give [administrators] data that they'll make a decision off of. And so the question that we have in mind when people start asking for our data is, 'Great, I'm glad you're asking for this, but what decision will you make off of it?'"[34]

By hiring more staff to collect and analyze data, institutions will be better equipped to handle increasing demands for quality information that advises decision-making at all levels. These investments are even more important in times of economic downturn, as students of color and low-income students are more likely to struggle or drop out, even as institutions have to budget limited resources for student supports.

Adequate staffing also is crucial to develop and implement data governance processes and to execute complex data sharing arrangements. Kintzel from MO-DHEWD clarifies the process for establishing these:

> "Data linkages, data use, and really solving all of the barriers and working through all the MOUs [Memorandum of Understanding] to make this happen—it's still nobody's full-time job. There's still really no one in the state who's focused on this and who's charged to reach out to all of the different agencies and take the time and space to help everyone to understand and rationalize their way through all the laws."

When hiring additional staff is not possible, some institutions leverage support from external consultants. Richmond elaborates on how this has been helpful to Pima:

> "We worked through [external consultants] for the initial construction of our warehouse and, on an ongoing basis, when there are particularly complex technical needs. We hand the requirements over to them with the specifications of what we need and have them do the intensive, more detailed work because we don't have staff time to be able to do it internally. Once it is implemented, our staff verifies the data and the consultant moves these data sets to production."[35]

Though institutions are excited to make changes and build capacity across campus to analyze data, it is just as important to realize that changing an entire culture so that it is more centered around data takes time. Wagner from Lesley University says to remember that "We're also moving at the speed of higher ed. So, things happen, but they happen much slower than I would like them to be."[36] Vickrey from MCCS shares this sentiment: "it's not moving along as fast as I would like. But again, with limited staff we do the best we can."[37]

For institutions to reach their greatest potential in driving forward a data-informed campus culture and meeting the data needs of campus stakeholders, they must invest and spend strategically to increase their capacity to collect, clean, and analyze data; expand upon the great work already being done by their staff; and encourage campus members to embrace the power of data-informed decision-making.

**Conclusions**

Institutions are working hard to support the growth and success of their students, and data should act as a tool to support these efforts. Campus offices can use data to highlight areas for institutional growth and improvement, while also reinforcing best practices for increased student success. Leveraging and disaggregating existing data may showcase better ways of serving Black, Latinx, Indigenous, underrepresented AAPI, and students from low-income backgrounds well, an objective that should be at the core of every institution.

Developing a strong, data-informed campus does not happen overnight. It takes commitment, time, energy, and investment. It takes the development of relationships between offices, departments, and institutions. It takes shifting campus attitudes and beliefs about data to transform culture. It becomes a bigger lift when campus and state resources become scarcer. But a stronger, data-informed campus culture serves administrators, staff, faculty, and students alike, by creating an atmosphere where decisions are rooted in a goal of improving outcomes for students, particularly students of color and low-income students, and ensuring they receive a valuable education. This goal has never been more essential nor the moment riper for institutions to transform their enthusiasm into equity-centered, data-driven change.

**Appendix: List of Telephone Interviewees**

| Institution | Name | Title |
|---|---|---|
| Lesley University (Massachusetts) | Alexander Wagner[†] | Director of Institutional Research in the Office of the Provost |
| | Randi Korn | Assistant Provost for Academic Success |
| Maine Community College System | Diane Vickrey | Director of Institutional Research |
| Missouri Department of Higher Education & Workforce Development (MO-DHEWD) | Jeremy Kintzel | Director of Data and Research Services |
| | Erik Anderson | Director of Academic Research |
| | Allyssa Miget | Senior Policy Advisor to the Workforce Development Director |
| Pima Community College (Arizona) | Dr. Nic Richmond | Chief Strategy Officer and Vice Chancellor of Strategy, Analytics and Research |
| Southern Maine Community College | Barbara Conner | Dean of Student Success and Enrollment Management |
| University of Illinois at Chicago | Dr. Bernie Santarsiero | Director of Research Initiatives in the Office of the Vice Provost for Diversity |
| University of Nebraska–Lincoln | Dr. Amy Goodburn | Senior Associate Vice Chancellor and Dean of Undergraduate Education |

[1] Global Strategy Group. (2020, May 28). Higher ed survey highlights the academic, financial, and emotional toll of Coronavirus on students. https://s3-us-east-2.amazonaws.com/edtrustmain/wp-content/uploads/sites/3/2017/11/27120859/Higher-Ed-Nationwide-CA-Memo-F05.27.20.pdf.

[2] DeBaun, B. (2020, March 30). FAFSA completions tumble nationally over Coronavirus. https://www.ncan.org/news/498091/FAFSA-Completions-Tumble-Nationally-Over-Coronavirus.htm.

[3] Rorison, J. & Voight, M. (2016). *Leading with data: How senior institution and system leaders use postsecondary data to promote student success*. The Institute for Higher Education Policy. http://www.ihep.org/research/publications/leading-data-how-senior-institution-and-system-leaders-use-postsecondary-data

[4] CUNY Matters. (2018, February 16). Keep on moving on. http://www1.cuny.edu/sites/matters/2018/02/16/keep-on-moving-on/; and Mugglestone, K., Roberson, A.J., & Voight, M. (2020, February). *Postsecondary data GPS: A guidebook for navigating data to promote student success*. Institute for Higher Education Policy. http://www.ihep.org/research/publications/postsecondary-data-gps-guidebook-navigating-data-promote-student-success

[5] DeBaun, B. FAFSA completions; and Global Strategy Group. Higher ed survey.

[6] IHEP analysis of workbooks from Minneapolis summit.

[7] Anderson, E. (2019, December 10). Phone interview with A.J. Roberson and K. Mugglestone.

[8] IHEP analysis of workbooks from Minneapolis summit.

[9] Vickrey, D. (2019, December 3). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[†] Alex Wagner now serves as director of research analytics at Emory University.

[10] Goodburn, A. (2019, December 10). Phone interview with A.J. Roberson and K. Mugglestone.

[11] Richmond, N. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[12] Santarsiero, B. (2020, April 1). Phone interview with M. Maldonado and K. Mugglestone.

[13] Richmond, N. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[14] Richmond, N. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[15] Massachusetts Institute of Technology (2020). Supporting data-informed decision-making at MIT. https://datatalks.mit.edu/.

[16] Wagner, A. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[17] Vickrey, D. (2019, December 3). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[18] Kintzel, J. (2019, December 10). Phone interview with A.J. Roberson and K. Mugglestone.

[19] Santarsiero, B. (2020, April 1). Phone interview with M. Maldonado and K. Mugglestone.

[20] IHEP analysis of workbooks from Minneapolis summit.

[21] Vickrey, D. (2019, December 3). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[22] Wagner, A. (2019, December 5). Phone interview with A.J. Roberson and K. Mugglestone, and IHEP analysis of workbooks from Minneapolis summit.

[23] Richmond, N. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[24] Santarsiero, B. (2020, April 1). Phone interview with M. Maldonado and K. Mugglestone.

[25] Santarsiero, B. (2020, April 1). Phone interview with M. Maldonado and K. Mugglestone.

[26] Richmond, N. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[27] Johnston, S. W. (2019, May). The Analytics Imperative. *Business Officer*. https://businessofficermagazine.org/features/the-analytics-imperative/

[28] Change with Analytics. (n.d.). Statement. https://changewithanalytics.com/statement/

[29] Change with Analytics. (n.d.). Resources. https://changewithanalytics.com/resources/

[30] Goodburn, A. (2019, December 10). Phone interview with A.J. Roberson and K. Mugglestone.

[31] Conner, B. (2019, December 3). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[32] Goodburn, A. (2019, December 10). Phone interview with A.J. Roberson and K. Mugglestone.

[33] IHEP analysis of workbooks from Minneapolis summit.

[34] Conner, B. (2019, December). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[35] Richmond, N. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[36] Wagner, A. (2019, December 5). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.

[37] Vickrey, D. (2019, December 3). Phone interview with A.J. Roberson, K. Mugglestone, A. Brown-Grier, and J. Cohn.