It is easy for industry professionals in enrollment management to be reactive. As issues arise, it is natural for leaders to ask for more information. Inevitably, those questions center around, “How many?” For example, how many applications were received? How many students registered for classes? How many financial aid awards were made? These questions are important to answer, especially when compared with year-over-year data, but using these questions alone as a university’s “data-driven” strategy limits forward thinking. In a climate where high school graduate numbers are expected to decline in 2025 (WICHE 2021) and COVID-19 has exacerbated that enrollment decline for many higher education institutions, university enrollments are likely to experience survival of the fittest (Kelderman 2019). Survivors will likely be those who proactively assess their institutions using sophisticated, data-driven approaches. But assessment in and of itself will not be enough. The survivors will proactively assess themselves and be humble enough to listen to those assessments and
take significant action (Gardner 2019). Unfortunately, even with the business sectors proving the importance of leveraging data, higher education is slow to adopt these strategies. This article will provide some insight into steps an enrollment management team can take to leverage data to think beyond “how many” and open up opportunities for growth, despite the adversity.

Data Accessibility

Before it is possible to discuss leveraging data effectively, it is important to address the elephant in the room. Effective and proactive decision-making hinges on data accessibility and transparency. Due to legitimate laws surrounding data use, especially in financial aid, higher education is very good at creating data silos. The financial aid team only looks at financial aid data. The admissions team only looks at admissions data. The registrar’s team only looks at enrollment data. Yet, at the intersection of these silos is where insight lives. It is essential to break down these silos to join admissions, enrollment, and financial aid data. The admissions team only looks at admissions data. The registrar's team only looks at enrollment data. Yet, at the intersection of these silos is where insight lives. It is essential to break down these silos to join admissions, enrollment, and financial aid data. While this is easy to say, the data behind these areas are extremely complex, especially considering how many popular student information systems are structured. Merging these areas effectively requires strong collaboration between department experts and the university technology administration as well as enrollment management leadership to guide the discussion. Likely, it will involve bringing technology and content experts together across the university to share understanding prior to starting any research. Breaking down data silos is one step toward sophisticated analytical modeling to support data-driven decision-making.

Where Are We Now?

There is a lot of value in knowing where an institution is now, as compared to where it was in years prior. The ability to pivot quickly as things change depends upon knowing where the institution is, as compared to this day last year and compared to this day two years ago. And, as the institution pivots, it is important to be collecting data on these changes and new initiatives to ensure that the pivots are effective. This could mean watching the regularly collected data, such as how many applications were received or how many students registered for classes. However, this might also mean collecting new data. For example, with the COVID-19 pandemic, every institution faced the need to pivot quickly. Hundreds of questions arose. For example, do we become test optional? Do we extend the response deadline? How do we recruit, since we cannot travel to high schools? How do we support students who need additional financial support? Are we going to be able to make our class? Will we retain our previously enrolled students if we switch to an online modality? In the case of COVID-19, the historic data would no longer serve the institutional needs, at least not in the traditional ways. Comparing year-over-year data was not as useful when the climate had shifted. Instead, institutions faced the challenge of collecting new data.

For the prospective students at Virginia Commonwealth University (VCU), this new data collection took the form of quick surveys administered via text message and e-mail. By defining a closed-ended set of four to five questions, plus one open-ended question, VCU was able to quickly ascertain how COVID-19 impacted its students early in the pandemic. By keeping the survey very short, VCU was able to encourage responses via text, where leaders knew they would have the highest response rate. The university also sent unique survey URLs in order to leverage the quantitative data already in the student information system and CRM to divide the responses by first generation status, Pell eligibility, and other factors of interest. These identified factors allowed VCU to see whether certain at-risk populations were disproportionately disadvantaged by the pandemic. Then, the university could adjust its responses and support accordingly. In addition, by using identified surveys, the university could intervene immediately as students needed support. The survey provided students a forum to voice their challenges at a time when that was not always easy to do.

As summer progressed, these short surveys gave VCU extensive feedback about how its students were faring during the pandemic. At the end of the summer, VCU decided to do a quick poll of students who chose
not to enroll. Interestingly, the university found that students who chose to attend another four-year institution followed reasoning similar to prior years. For example, some said they were accepted off the waitlist of their dream school. Or, they received more financial aid from another institution. Very few of these students chose a different four-year institution due to the impacts of COVID-19. The responses from students who chose to enroll at a two-year or community college were more mixed. Some reported traditional reasons, like saving money by not starting at a four-year institution. Others said they were impacted by COVID-19, and finances or the need to stay close to home became important factors in their decision. The students who deferred or took a gap year were the ones who were most impacted by COVID-19. Some could no longer afford to go to college. Others did not want to risk having their classes online or were worried they would catch the virus if their classes were in-person. Yet others just wanted to see the fallout from the pandemic before enrolling in college. In the one open-ended question, VCU gave students a chance to share whatever they wanted VCU to know. Sometimes, providing a forum for students to share what they want gives a level of insight beyond answers to directed questions. In this case, a large number of students voluntarily shared that they still planned to attend in a future term. This was very important information, as VCU could continue to work with these students in supporting their applications to future terms. While these short polls might not seem like a lot of information, the results had long-term effects for understanding who was going to enroll, both in fall 2020 and in future terms. VCU knew to continue to cultivate the leads from its students who enrolled in two-year or community college or who deferred or did not enroll elsewhere. VCU also realized that the students lost to four-year institutions were the students it traditionally lost to its competitors. VCU even found out about some procedural issues that were necessary to address internally to better support students.

As evidenced by these examples, sometimes the simplest data points can be powerful for decision-making. Enrollment managers don’t have to be experts in statistics to compare where the university is to years prior or to collect short surveys. These tools can be employed quickly and be very powerful. However, while these year-over-year comparisons and short surveys have tremendous potential and applicability, they are still reactive. They inform where you are, not necessarily where you are going or where you will end up. Therefore, these tools are best used in combination with more sophisticated strategies, like predictive analytics.

**Predictive Analytics**

There are varying types of predictive analytics—some that are high quality and some that are not particularly useful. And, depending on the discipline of the creator of those predictive models, the types of models can differ dramatically. For example, someone trained in educational statistics will likely use different models than someone trained in business statistics, who is different from someone trained in econometrics. While any of these disciplines can provide excellent predictive modeling, they use different methodologies, which can make it more difficult to discern good predictive modeling from bad. So, what should higher education practitioners do?

Predictive models can take on many forms, depending on where a student is in the college lifecycle. In admissions, those models tend to be predicting an action: whether or not students apply, whether or not they deposit, and whether or not they enroll. These admissions models can include different pieces. Some look only at the basic information you have from the initial prospect records (such as list purchase or inquiry) and any additional information obtained from public sources, like federal census data. These models typically give a likelihood score, which shows how likely a student is to apply or enroll. These models are potentially helpful in knowing where to allocate resources for recruitment; however they limit knowledge on how to convert a prospective student to an enrolled student. No matter what action or inaction a student takes, their likelihood of applying and attending never changes in the model. For example, two students from the same high school both have a likelihood of enrolling of 38 percent. One
visits campus, and the other unsubscribes from mailings. Enrollment management professionals know that a campus visit is one of the strongest predictors of matriculation, yet this type of predictive model does not account for that. This type of model can be useful in determining who to target from a list purchase or what names to purchase, but it is not particularly useful later in the admissions funnel.

Other admissions models include behavioral data. Each action a student takes changes their likelihood score. Considering the example above, a student might start out with a likelihood score of 38 percent. There is a 38 percent chance of that student enrolling, based upon the initial prospect information. However, that student then visits campus. As is well documented in admissions research (e.g., Goenner and Pauls 2006; Yost and Tucker 1995), a visit to campus is the strongest predictor of a student enrolling in the future. Now that this student visited campus, the model produces new results, showing an 85 percent chance of that student enrolling. In addition, these behavioral models can predict what actions a university can take to increase that student’s likelihood of attending. Where a $5,000 scholarship might only increase the likelihood of attending for one student by 2 percent, it might influence another student by 30 percent. With limited funding, this type of behavioral modeling can help allocate resources to get the most return. Unfortunately, what this modeling does not address is the ethical framework behind those scholarship allocations. Whether or not it is ethical to allocate funds to influence behavior in that way is something universities need to discuss as they work to develop and implement these models. Even if these financial influencers are not used, many of these models show other options for influencing student behavior, like a phone call from a counselor, a visit to campus, or a message from a faculty member. Knowing strategically when and how to encourage a student can go a long way toward increasing yield, especially with limited resources and increasing competition for students.

Financial aid is another big area for predictive modeling. A well thought out aid strategy is essential at any institution and will become even more important as competition for students increases. Many institutions focus on leveraging financial aid and scholarship packages to entice students to enroll. However, some institutions, whether intentionally or inadvertently, pull a bait and switch move, providing students with a great package in their first year but worse packages in later years. So, while financial aid and scholarship packages are essential tools for encouraging matriculation, they also are important tools for retention and graduation. Therefore, it is important to analyze the long-term effects of these award strategies, beyond initial matriculation. Are institutions systematically hindering some students from being able to graduate due to their financial aid awarding strategy? To assess these effects, sophisticated financial aid models are required. To assess the impact of financial aid on an enrolled student, a longitudinal model is necessary, as one year’s worth of financial aid data can be misleading. The best models allow for predictors that stay constant, like first generation student status, but also account for time varying predictors, like semester grade point average (GPA), satisfactory academic progress (SAP) status, or Pell eligibility and receipt. For example, VCU ran a time series analysis based upon the work of Desjardins, Ahlburg, and McCall (1999). Time series models are useful, as they take into account static indicators like first generation status, but also include indicators that change with each semester, like GPA or housing location. They also adequately deal with students graduating or dropping out at different time points. Other models need everyone to graduate or drop out simultaneously, which does not reflect the actual behavior of students in higher education. The goal of VCU’s model was to determine how unmet financial need impacted a student’s ability to graduate in four or six years. As a large public institution, VCU was unable to meet the financial need of every student enrolling in the university; therefore, it wanted to know if there was a tipping point in unmet need. Was there a certain amount of unmet need that students could cover with summer jobs or other supplemental methods external to the university, without the unmet need threatening their ability to retain and graduate? Through this model, VCU learned a lot about the impact of unmet financial aid.
need on its students. While there were certainly many contextual factors necessary to consider, this modeling gave VCU some additional information to help guide its awarding strategy. The university was able to use this model, along with other research, to change some of the financial aid awarding strategies to better support its students in the long term, which played into continued growth in four- and six-year graduation rates. Time series analyses are one of many types of longitudinal financial aid models. They are simply one example of how institutions can leverage predictive models to support effective financial aid awarding strategies. Since institutions differ greatly in terms of funding sources, requirements, and strategies, the type of financial aid predictive modeling will vary by institution, SEM plan, and research question.

Institutions can model the behavior of students for long-term planning as well as short-term program assessment. Modeling student behavior allows institutions both to see if programs are effective and to determine opportunities for new programming due to the ever-changing nature of higher education. Institutions can apply such programming at any stage of students’ college going. For example, many students struggle in their first semester in college, as they adapt to the demands of college. Unfortunately, some of those students struggle to the point where they have issues with academic standing at the end of their first semester, making them a retention risk. At VCU, leaders wanted to see if it was possible to predict who was going to end up in academic trouble, so that they could implement programming to support those at-risk students. The university ran a series of models using data from students’ admissions applications to see if they could predict who would end up with poor academic standing at the end of the first semester. The most effective of those models demonstrated that certain subsets of students tended to end up in this category. For example, VCU had one of the top arts programs in the United States but also required students complete a general education core in order to graduate. While students enrolling in the arts programs were outstanding artists, they were not used to balancing the amount of work required in college-level studio art classes while simultaneously taking general education classes. They needed to ease into that transition. Based upon an analysis, VCU was able to offer targeted summer bridge programming for those students, which included summer classes and programming that focused on time management and study skills as well as how to use campus resources to support their learning. These summer bridge courses also allowed the students to take a lighter course load in the fall. This optional programming greatly benefited the students, decreasing their likelihood of ending up in poor academic standing. It also benefited their mental health in managing college courses. While summer bridge programs are not new, this predictive modeling showed that different populations of students needed different summer bridge programs. Retention models are essential parts of predictive modeling for SEM. Many universities struggle with retaining students. If universities can identify populations of students who are at risk, they can develop specific programming to support those students, increase retention rates, and decrease time to graduation.

**Intersectionality**

Predictive models, up until recently, tended to focus on big bucket predictors, like race and ethnicity, Pell eligibility, or first generation status. However, a particular student’s experience is unlikely to fit fully in any one of these buckets. Unless an institution is homogenous, it is likely that grouping students into large buckets is insufficient to describe their collegiate experience. Therefore, the most effective predictive models include intersectionality, where major buckets are combined with other major buckets to create smaller buckets that more accurately explain a students’ lived experience. Including intersectionality typically increases the amount of variance explained by a model, providing stronger models and more information about what interventions
might change an outcome. But adding intersectionality to statistical modeling requires power. Power, in statistical terms, means you need a sufficient number of people in each group to find statistical significance, if it is there. Without enough people at each intersection, the model will not run appropriately. For smaller colleges or populations, the number of intersections may need to be limited to provide the necessary power for a model to work. At larger institutions, sufficient power is usually easier to accomplish, simply due to the number of students in the population of interest.

**Return on Investment**

For many in higher education, the term “return on investment” has negative connotations. Stakeholders are wary of accountability for the ways in which leaders allocate or spend resources. In higher education, it is easy to say that institutions are doing everything they can for their students given the amount of resources available. And, likely, all the available resources have been invested. It is tempting to hide under a rock and assume those investments were, and continue to be, effective. There are many vendors vying for attention, usually involving six-figure annual contracts. Many of these vendors have been university partners for decades, but they may or may not be what the university needs now. Annually assessing the return on investment of vendors is essential. Vendors can be tremendous partners that can create opportunity the university cannot create by itself. But universities need to be good stewards of their funds and ensure those investments are effective.

As easy as it is to pick on vendors, as they usually hold big dollar contracts, the same return on investment analysis is important for internal initiatives and investments, too. Are the programs offered through enrollment management yielding the necessary results? Universities are quick to add programs and burden under-resourced staff but are rarely good at removing those programs and services when they are no longer effective. This can lead to inferior service as well as staff turnover. A return on investment assessment can show which services and programs are working so that resources, including people, can be deployed in the best way possible to benefit students and encourage staff retention.

**Qualitative Research**

Up until this point, this article focused entirely on quantitative methods to enhance efficacy in enrollment management. At large universities in particular, leaders are quick to use quantitative research to answer questions. Universities collect and leverage massive amounts of data on prospective and enrolling students to make positive changes. However, it is critical not to lose sight of the stories of our students. While anecdotal evidence can be misleading, understanding the nuances of the students exemplified by our quantitative data can be powerful for innovation and effective change. For example, VCU recently completed a study of adult learners. While the quantitative data provided extensive information about behavior, it did not address why a student started or returned to college as an adult learner, what barriers they faced, what support structures they needed, or how relationships impacted their abilities to enroll, retain, or graduate. Through qualitative research, VCU was able to glean not only the answers to these questions, but the questions it did not know to ask. Sometimes, by simply giving students a chance to speak, institutions can gain tremendous insight. For example, in this adult learner study, VCU found that adult learners wanted the university to recognize them as distinct and unique from their traditional counterparts. Giving them a voice and a name empowered them for success in their journey. Without the qualitative part of this study, VCU would not have known the importance of recognition for these students. Systematic qualitative research provides insight beyond the anecdotal squeaky wheel by providing depth and richness to an institution’s understanding of students’ experiences.

**Mixed Methods Research**

As evidenced by VCU’s adult learner study, mixed methods research—where both quantitative and qualitative research is used to answer research questions—is the best methodology for making data-driven decisions in SEM. The quantitative or qualitative results alone do
Quantitative data will always provide a response to the questions posed, assuming the data is available, but only works when leaders know what questions to ask. Qualitative data provides context, but that context is limited to the population interviewed; it may not be generalizable to the broader population. Combining these methods together creates an understanding that allows for both generalization and context. The downside to mixed methods research is time. Qualitative and mixed methods research take significantly more time than quantitative research. However, if appropriate time is allocated, mixed methods research can provide insight that better informs long-term strategy.

Data Transparency

While conducting research surrounding the units of enrollment management is essential, that research is worthless if leaders don’t share and use the results. Good research highlights opportunities for real change. To many, change is scary and daunting, so it is easier to ignore the research and maintain the status quo. But the status quo is no longer enough. Universities are going to close (Grawe 2018; Kelderman 2019). Those willing to have the tough conversations and make real changes will survive, and even thrive, in the face of adversity. Research, if done properly, reveals truths that may cause significant discomfort. It tells us what institutions do well, along with the things they do poorly. Sometimes institutions disregard research simply because it is easier to hide the negative truths than to deal with them. In many cases, that only means delaying the inevitable; truths will be noticed but usually at a more inopportune time. Being strategic involves dealing with the good, the bad, and the ugly. It involves tough decisions but can result in lasting and effective change.

Recommendations

While there are many ways to approach developing a research-driven strategy for effective SEM, there are two areas that are common barriers to implementation: the cost and capacity of personnel; and structuring a return on investment assessment strategy. The following section provides examples of ways to overcome these barriers in order to leverage effective research for decision-making.

Personnel

One of the most common barriers to implementing an enrollment research and evaluation strategy is cost. Statisticians and researchers require a lot of funding. First, it is important to note that investing in enrollment management research is worthwhile. Strategic investments in data-proven methods can lower the overall cost of yielding students, eliminate ineffective contracts with vendors, adjust programming to be most effective in supporting students, and adjust financial aid strategies to benefit student success. The investment in research, while expensive at the outset, will pay for itself over and over again. However, there are also creative and less expensive opportunities in higher education systems. There is a wealth of knowledge among the faculty at the institution. Professors of statistics, education, business, and other areas may be in a unique position to support SEM efforts. Partnerships with professors can enable publication opportunities for them, while simultaneously providing the operational support needed for successful enrollment management. Statistics departments can develop models. Education professors may already be doing research that could provide insight. Faculty may have networks with community colleges, high schools, state policymakers, and others. Professors and other academic professionals may be able to support enrollment management in new and innovative ways.

Graduate students are another great resource. They are usually seeking opportunities for internships and access to data for dissertations. Although they likely will need more oversight than a professional researcher will, they can provide extensive support. One creative partnership VCU developed was between the School of Education’s doctoral qualitative research methods classes and SEM. The first half of the course was spent doing a hands-on qualitative research project for SEM, where the doctoral students could learn how to do effective, hands-on qualitative research. SEM provided the topics and recruited the students to be interviewed, while the
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doctoral students developed the theoretical frameworks, conducted the studies, and compiled the results as part of their class. These types of creative partnerships with existing entities on campus can provide experiential learning opportunities and lower the costs of doing research. There are many ways to gain the bandwidth to conduct research, without additional financial burden; leaders often need only to look inside their institution.

**Return on Investment Strategy**

Assessing return on investment can be daunting, especially given the number of programs, vendors, and investments utilized in enrollment management. It can be difficult to know which questions to ask or how to approach conducting a return on investment assessment. Here are a few items to consider as a frame for any return on investment assessment.

- **Are they making a difference?** The purpose of these vendors, programs, and investments is to move the needle in some way that the university cannot on its own. While vendors typically provide their own assessments, institutions should always conduct an internal assessment. An internal assessment can shed light on areas that a vendor may not see or know. For example, a vendor might show that they enrolled 350 students. However, if you enrolled 350 students the year before when you were not using the vendor, then the net yield is zero. If you only enrolled 100 students the year before, then your net yield is 250 students.

- **Are they cost effective?** To determine efficacy, it can be helpful to focus on the cost per student. This provides a quick and easy way to compare vendors, if you’re using more than one. For example, if your institution uses multiple search vendors for purchasing names for the top of the admissions funnel, you can compare yield results of those names to determine efficacy. A very simple way to do this is to take the total cost of the purchases by a vendor or in an area and divide that by the number of purchased students who enrolled. That will tell you the cost per enrolled student, which can then be compared to other vendors or areas.

- **Are they pertinent?** Many vendors are slow to innovate. A vendor that was cutting edge five years ago may not be so now. Technology evolves quickly, so partnering with companies who regularly iterate and innovate is essential. If they’ve stagnated and/or are no longer pertinent, it might be time to move on. The same goes with internal programs and offerings. With each new contract, it is important to take a step back and assess the landscape. What are other vendors in the same space doing? The time spent in evaluation will enable institutions to be poised to innovate.

These questions are a starting point for assessing the return on investment. Sometimes, conducting a return on investment assessment can identify where an institution might reallocate funds to develop an enrollment research and evaluation strategy for more in-depth research and evaluation.

**Conclusion**

It is impossible to be strategic without the underpinnings of knowledge that comes from research. Institutions can form strategy by effectively leveraging any one of the tools outlined in this article. However, combining these techniques together provides the best opportunity for innovation and long-term success. Practitioners who know where their university is at compared to years past allow for a daily pulse check. For admissions, that daily check frequently involves concerns over not making the class or not having enough housing if the class is too large. These pulse checks also enable leaders to know how subsets of populations are faring so they can make adjustments along the way. Leaders can combine these pulse checks with predictive analytics and other types of research for more long-term planning. If a particular population is not yielding well in admissions, institutions can design predictive models to find ways to bolster that population. They can then combine the predictive models with qualitative research to understand why that population is not yielding. Then, after implementing new strategies or engaging new vendors, a return on investment assessment can determine the efficacy of
these strategies. These are great tools for developing and implementing a multi-year SEM plan, which is clearly outlined in the *Handbook of Strategic Enrollment Management* (Hossler and Bontrager 2014), defined by much of the work of AACRAO community leaders (*e.g.*, Bontrager 2004), and emphasized in AACRAO’s Essentials of Strategic Enrollment Management course (AACRAO 2021). Research is key to SEM planning. Ultimately, SEM also requires strong leadership, an investment in knowledge, a willingness to find the pain points, and the strength to manage change. It is time to stop maintaining the status quo and put strategy in SEM.

**References**


AACRAO. See American Association of Collegiate Registrars and Admissions Officers.


**About the Author**

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Amy Hutton, Ph.D., served for many years as the Director of Enrollment Research and Evaluation at Virginia Commonwealth University, as well as an adjunct professor of statistics in the Ph.D. in Education program. She has extensive expertise in quantitative, qualitative, and mixed-methods research, as it relates to strategic enrollment management. For her innovative approaches to leveraging research in higher education, she was awarded the National Student Clearinghouse Outstanding Research Award at the AACRAO Strategic Enrollment Management Conference in 2020. Prior to her work in enrollment research, Dr. Hutton served as a professional stage manager, assistant professor of theatre, and director of admissions. Dr. Hutton holds a Ph.D. in Education: Research and Evaluation and a M.F.A. in Theatre Pedagogy from Virginia Commonwealth University, as well as a B.M.A. in Music and Communications from DePauw University. Dr. Hutton’s research interests focus on improving success outcomes for underrepresented student populations, developing personalized marketing strategies, and effectively leveraging financial aid to improve student success. Dr. Hutton currently serves as the Assistant Vice President for Enrollment Management at The University of Alabama.