

ATTAINMENT FOR ALL: POSTSECONDARY PATHWAYS

Data-Driven Student Interventions

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INTRODUCTION

While state policymakers may consider adopting new strategies that can be used to raise attainment rates and help students succeed, they should also think about options for reimagining fundamental student supports using innovative approaches. There is nothing new about helping students pick a career pathway, preventing students from dropping out, providing feedback to help students pass courses, or providing the support they need to attain a high-quality certificate or credential. However, the emergence of pioneering approaches that leverage student data, along with technological advancements in Student Information Systems (SISs), have led to a new set of approaches that policymakers can use to help students succeed using these time-tested strategies.

Many state and institution leaders have focused a considerable amount of energy on the development of data-driven student support tools that can be used for a variety of purposes. But tools aren't enough to drive progress – policymakers must also consider the human component of the equation and explore best practices of how such tools, and the student information they produce, can be used to make progress toward different higher education goals – including raising statewide postsecondary attainment rates.



OVERVIEW OF DATA-DRIVEN STUDENT SUPPORT TOOLS

Many data-driven tools that are used to support student success fall into three broad categories¹:

| EARLY ALERT SYSTEMS | COURSE RECOMMENDATION ENGINES | ADAPTIVE LEARNING TECHNOLOGIES |
|---|--|--|
| <p>Early Alert Systems use academic (and sometimes non-academic) student data to determine which students might need additional support in order to stay on track for on-time completion. These systems can also be used to determine which students may be very close to completing a degree – or even students who may have earned a degree and haven't realized it.</p> <p>Example: Developed at Georgia State University (GSU), the GPS Advising system allows GSU counselors to target supportive interventions for students who enroll in courses that do not help them make progress toward their degree, or to those who are underperforming in key courses. The GPS system includes over 800 different, individualized types of alerts that can be used to engage students – for example, one alert might indicate that in order to complete a nursing degree on-time, a student should earn at least a B+ in a certain math course.²</p> | <p>Course Recommendation Engines use historical data about how previous students have performed in certain courses to help students chart intentional course pathways within a program of study – and, in some cases, predict which students may have the greatest chance of success on particular pathways.</p> <p>Example: Developed at Austin Peay State University, Degree Compass was designed as a recommendation engine that would help students chart a course toward a certificate or degree and also provide predictions of whether students would pass certain courses.³</p> | <p>Adaptive Learning Technologies use data on interim measures of student learning, such as formative assessments, to identify gaps in knowledge and to adjust content delivery within courses to support deeper learning.</p> <p>Example: Arizona State University (ASU) is leading the way with the school's use of adaptive learning technology in introductory courses. By using a variety of adaptive learning tools, ASU faculty are able to gain more insight into areas of need for individual students - and to personalize instruction and support based on that data. In college algebra, the use of adaptive learning technology increased student success to the point where remedial math courses were no longer needed.⁴</p> |



INNOVATIVE EXAMPLES OF DATA-DRIVEN STUDENT INTERVENTIONS

In addition to the examples cited above, a number of innovative leaders have begun to think more holistically about how data-driven tools can be combined into a comprehensive suite of student supports – and how such tools can be scaled widely across institutions of higher education (IHEs). Here are two examples of forward-thinking initiatives underway:

MOMENTUM YEAR

When Dr. Tristan Denley, who led the development of Degree Compass during his time at Austin Peay State University, arrived at the University System of Georgia (USG) in 2017, he began to use a number of data analysis techniques he had developed throughout his career to lay the groundwork for a comprehensive framework to support student success. Through his analysis, Dr. Denley determined five particular aspects of a student's first year in higher education where there appeared to be unintended systemic barriers:



Making a purposeful choice about which program of study to choose – right at the start of their first semester;



Cultivating a productive academic mindset, including a sense of purpose, belonging, and perseverance;



Signing up for a course schedule, aligned with a clear academic pathway, that allows them to complete 30 hours of coursework in their first year;



Ensuring that their schedule includes at least nine hours of courses that have a direct connection to the program of study they have chosen; and



Succeeding in freshman English and Math courses.

USG leaders developed a framework that provided guidance on how USG institutions could use data-driven tools – including early alert systems, course recommendation engines, and adaptive learning technologies – to support all five aspects of the Momentum Year. The framework allows IHEs to take advantage of centrally-developed tools and best practices while remaining flexible enough for institution leaders to customize their approach based on their student population and mission.

All 26 USG institutions had some version of the Momentum Year framework up and running for the freshman class of Fall 2019. Going forward, Dr. Denley and his team are focused not only on working to continuously improve the framework on each campus but also expanding the model to cover additional support areas of a student's educational journey beyond their first year.

FINISH FIRST NC

As part of Wake Tech Community College's "Applied Benchmarking" initiative, which asks employees to brainstorm creative solutions to challenges they encounter in their work, Bryan Ryan and Dr. Kai Wang combed through data from the Integrated Postsecondary Education Data System (IPEDS) and system performance measures from the North Carolina Community College System on certificate and degree completion. They were looking for solutions that took advantage of the data they had and met four key criteria: high-impact, high-volume, low-resource, and low-cost.



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Data-Driven Student Interventions

The two administrators eventually developed a new tool called Finish First NC (FFNC), an innovative approach to an early alert system that identifies students who are very close to completing a certificate or degree. The new program met their criteria in the following ways:

| | | | |
|--------------------|--|---------------------|--|
| HIGH-IMPACT | Because of FFNC's focus on students who are very close to completing a certificate or degree – or may have completed the requirements for one without realizing it – low-lift interventions can have a significant effect. | LOW-RESOURCE | Mr. Ryan and Dr. Wang built FFNC to work within Microsoft Excel because of the software's wide availability. |
| HIGH-VOLUME | When they expanded FFNC out of the pilot phase, the tool had the ability to run credit analysis for all 30,000 Wake Tech students across over 300 certificate and degree programs. | LOW-COST | As long as an IHE has a Student Information System (SIS) that allows them to extract student transcripts and programs of study, the FFNC tool can be customized to work based on an institution's preferences and needs. |

FFNC acts as a complement to the efforts of IHE advisors and counselors depending on their needs and capacity – the tool can be customized so that IHE staff can focus their efforts on students who meet certain thresholds, such as those who have completed a degree program or those who are one semester away from completion.

Mr. Ryan and Dr. Wang are in the process of scaling adoption of the FFNC tool across all of North Carolina's 58 community college campuses. They are also focusing on developing best practice guidance around messaging and intervention strategies for reaching out to students who have been identified by the tool.

It is important to note that IHEs across the state of North Carolina are also using data-driven interventions. A recent survey of independent IHEs across the state showed that institution leaders use data to support students in a variety of ways.



CONSIDERATIONS

The data use cases described above have great promise and potential for helping students succeed. However, there are also a number of important considerations that state and institutional leaders must take into account in order to ensure that data is used to make progress in ways that are equitable, ethical, safe, and sustainable.

Data tools do not operate in a vacuum; they are part of a larger higher education ecosystem, and it is important to understand how using certain tools for different purposes can reverberate throughout the larger context of student success policies.

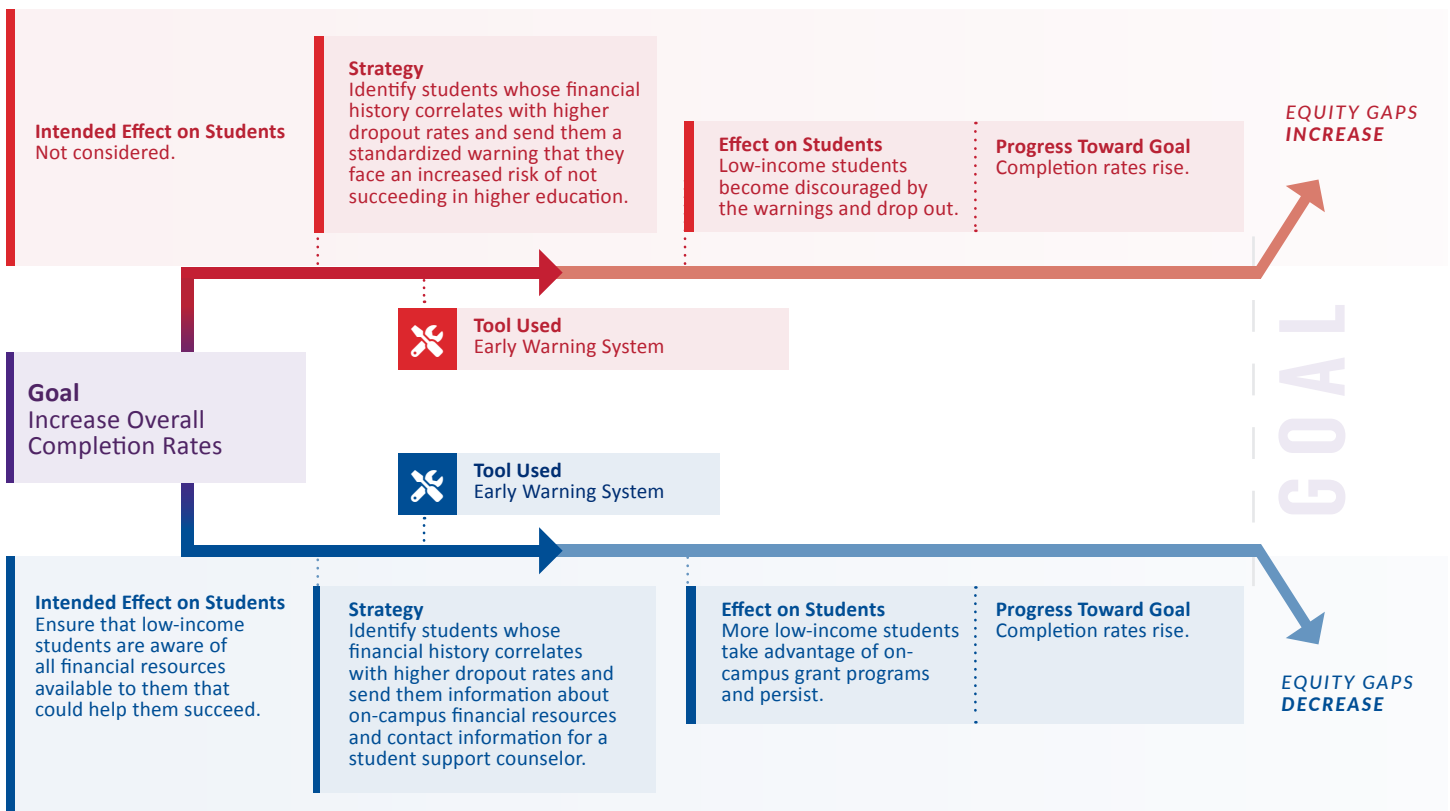
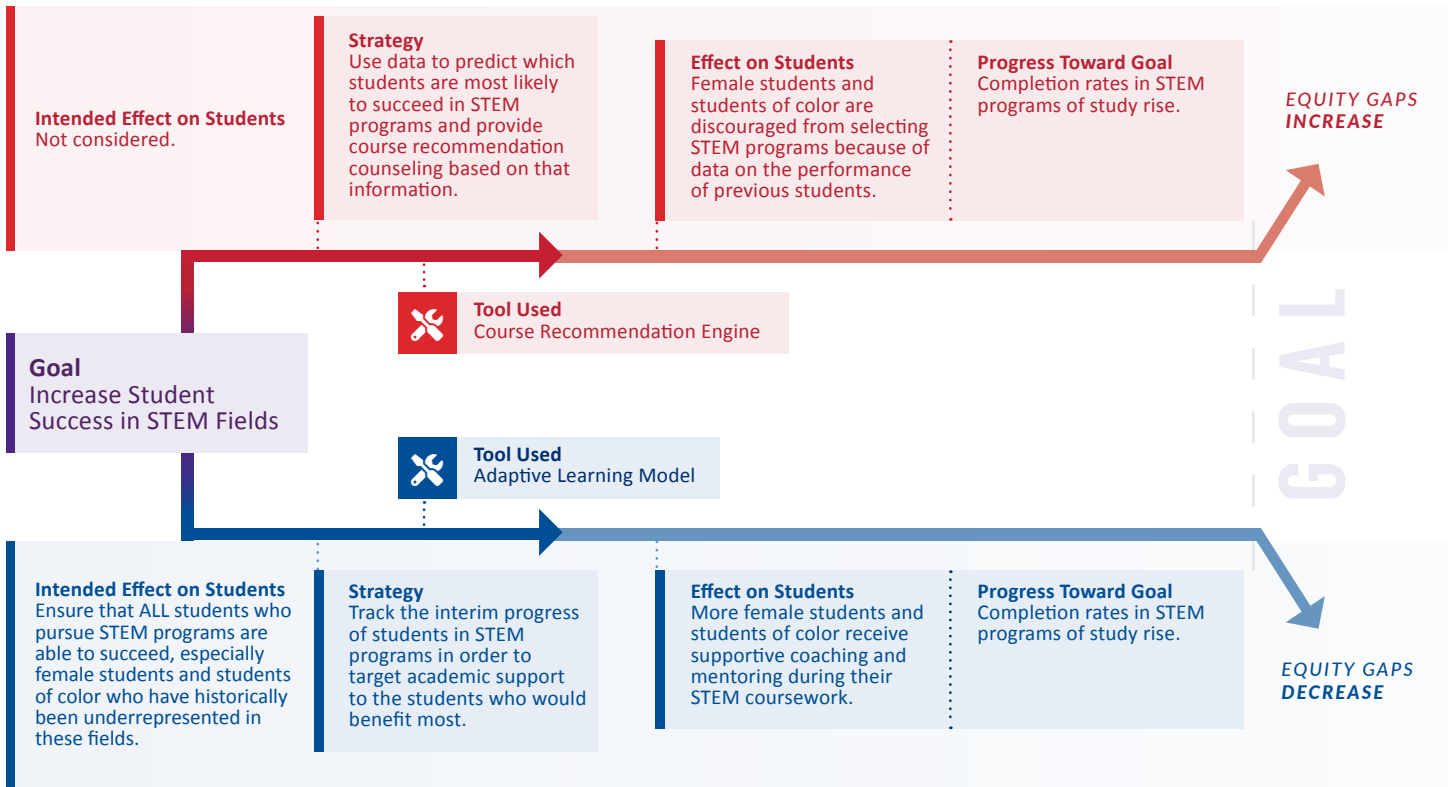
EQUITY AND ETHICS

As state leaders seek to raise overall attainment rates, they must also think about how to do so while simultaneously narrowing achievement gaps – or, at the very least, not exacerbating such gaps. Without building in equity considerations at every step of the process, data-driven tools can be used in ways that reinforce the systemic barriers that students of color, first generation students, and other underserved populations face.

Often times, the difference between using data in ways that worsen equity gaps versus ways that narrow them comes down to being thoughtful about how different approaches to making progress toward a policy goal can affect students in different ways.



EQUITY IMPLICATIONS OF DIFFERENT APPROACHES TO DATA-DRIVEN INTERVENTIONS





From an ethical perspective, policymakers should also consider the degree to which data-driven tools may constrain a student’s ability to develop their own capacities (self-development) and to make choices about their future path (self-determination).² These considerations must be weighed against the importance of encouraging students to make decisive choices early in their higher education journeys. Institution leaders are exploring different options of guiding students toward informed decisions about their programs of study without constraining their choices in significant ways.

STUDENT DATA PRIVACY AND SECURITY

Privacy and security are of paramount importance as policymakers consider expanding and adopting data-driven tools in higher education. At a basic level, institution leaders must ensure that their actions are in compliance with the Family Educational Rights and Privacy Act (FERPA) as well as any applicable state privacy laws. These considerations are especially important for institutions that work with a third-party vendor to administer portions of their data-driven tools.

Any use of data-driven tools at an IHE should happen within a broader framework of responsible use and protection of student data. Such frameworks should be based on a number of foundational principles, including transparency, governance, data minimization, and security.³

FERPA regulations govern the sharing of “personally identifiable information” (PII) that is contained within a student’s education record and could be used to identify that student. There are a number of scenarios under FERPA where institutions are allowed to disclose student PII without receiving explicit, opt-in consent. Some of the most commonly used scenarios are⁴:



Directory Information

Example: disclosing information about which students have received academic awards in order to verify their eligibility for scholarships.



School Officials with a Legitimate Educational Interest

Example: disclosing information about student performance with a tutoring service that provides academic counseling.



Study

Example: disclosing student information about course pathways in order to develop or administer a predictive tool.

It is also important that IHEs ensure that all student information is stored in accordance with proper, up-to-date security protocols.



THE ROLE OF STATE POLICYMAKERS

State policymakers have an important role to play in incentivizing the adoption of, and strengthening the effectiveness of, data-driven tools to support student success. Action on the state level can ensure that institution leaders are using data in ways that further progress toward statewide policy goals – and that student supports are informed by the type of data that allows for nuanced, effective interventions.

ALIGNING DATA-DRIVEN TOOL USE WITH STATE POLICY GOALS

As described in an earlier section, one key consideration in the use of student support tools is whether they are employed in ways that make progress toward intended policy outcomes. Institution leaders have a significant amount of leeway in terms of how they use the tools at their disposal to make progress toward different goals. For example:

Should early alert systems focus on reducing the number of students who drop out of higher education, or on increasing the number of associate degrees that are awarded?

Should course recommendation engines focus on identifying students who would succeed in key certificate programs that are especially valuable for regional employers?

Should adaptive learning technologies focus on supporting certain student populations who have traditionally been underserved statewide?



When state policymakers understand the data-driven tools that are in place at IHEs in their state, and the potential ways such tools could be used, they can set clear guidance on how to create alignment that will help the state achieve its goals. This guidance could be embedded in outcomes-based funding formulas that distribute funding to public IHEs, or be provided through convenings of state leaders and administrative teams from IHEs.

ENHANCING THE EFFECTIVENESS OF DATA-DRIVEN TOOLS THROUGH LONGITUDINAL DATA SYSTEMS

Any particular data tool or strategy is only as effective as the information it uses to draw conclusions and target interventions.

State policymakers are uniquely positioned to take actions that will increase the amount of high-quality education and workforce data that could be used to inform efforts to support higher education students – including through the creation of robust state longitudinal data systems (SLDSs) that contain linked student-level data throughout the entire education continuum. By leading on SLDS progress, they can also strengthen the effectiveness of data-driven student support tools by creating a richer set of information to inform the use of such tools.

For example, if an IHE data tool was able to incorporate information about the K-12 academic history of incoming students, it could more accurately help students chart an intentional degree pathway and determine which incoming students are most likely to need remedial support.

If an IHE data tool was able to track post-graduation outcomes (earnings, student debt, etc.) and tie those outcomes to specific programs of study, it could better inform student degree selection.

It is important to incorporate earnings data that is measured over an extended period of time (5-10 years) after graduation. Graduates of some majors (such as engineering) might reach their maximum salary shortly after leaving higher education, but the earnings gap between engineering majors and humanities majors narrows over time.⁵



GUIDING QUESTIONS FOR POLICYMAKERS

For policymakers who are interested in taking action to raise postsecondary attainment rates through the use of such tools, the following guiding questions will help them identify potential barriers to the widespread adoption of data-driven supports and develop an action plan for making progress.

DATA INFRASTRUCTURE AND CAPABILITIES

- ▶ Does your state have a robust longitudinal data system with student-level, linked information about student performance from K-12 through the workforce?
- ▶ How is this data stored/protected, and who can access it?
 - » Are IHE leaders and academic advisors able to access this information, and if so in what format?
- ▶ Are there ways that longitudinal student data can be packaged and disseminated in a format that could be used to inform the creation of data-driven student intervention tools?
 - » Is the student-level information in the state longitudinal data system able to be linked with information in the student information systems of IHEs?

USE OF DATA-DRIVEN TOOLS

- ▶ What policy goals has your state established regarding higher education students – specifically as they relate to persistence, retention, and completion?
- ▶ What are the greatest needs for higher education students in your state?
 - » Selecting an intentional degree pathway?
 - » Succeeding in certain key courses?
 - » Avoiding drop outs?
 - » Adapting to the rigor of higher education?
- ▶ What data or information would be ideal to help support students at IHEs in your state, and which role or position on IHE campuses would be best suited to provide such support?
- ▶ How could data-driven student support tools be used by IHEs to make progress toward your state's policy goals?



GUIDING QUESTIONS FOR POLICYMAKERS (CONT.)

INTERACTING WITH IHE LEADERS

- ▶ Are IHE leaders in your state aware of best practices regarding data-driven intervention tools?
- ▶ Do any IHEs in your state currently use such tools, or have plans to develop them?
- ▶ What sort of support or data do IHE leaders need from your state in order to make these tools usable and effective?

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