



Predictive Enrollment Analytics Collaborative for Community Colleges

Community College Executive Forum

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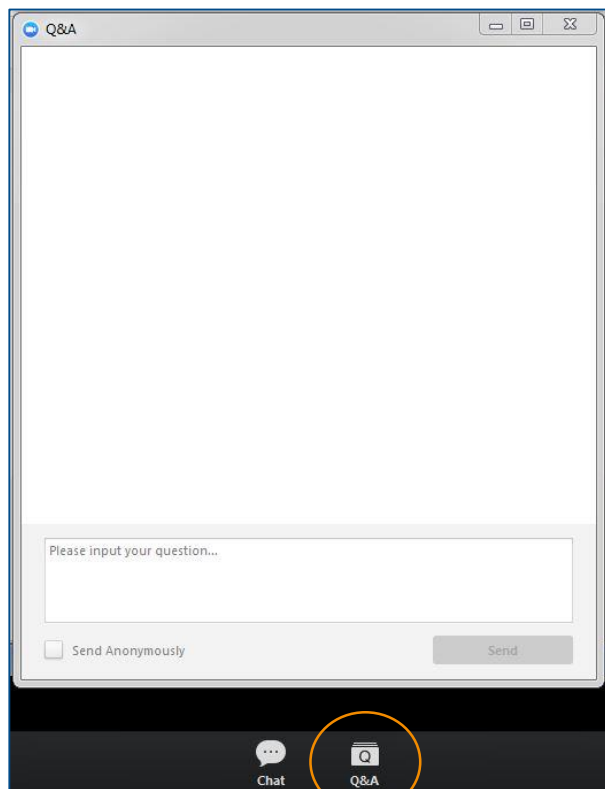


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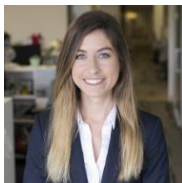
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Community College Executive Forum Team



Today's Presenter

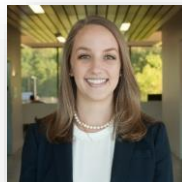


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Important Terms for Today's Conversation



Analytics:

The process of using data to figure out how to make a decision. Analytics involves gathering data, performing statistical analyses on it, interpreting the results of the analyses, and then using the results to make decisions. (Analytics becomes predictive analytics when statistical methodology is used to make predictions.)

Behavioral analytics: Gathering data about and analyzing patterns of how people behave (usually online), in order to infer how they might behave in the future and make strategic decisions.

Psychographic analytics: Quantifying qualitative information about how people think, believe, and prefer, then analyzing it to understand the link to behavior, in order to infer how people might behave in the future and make strategic decisions accordingly.

Confabulation: In analytics, the act of taking a decision made intuitively and making it appear as if it has been through analytics.



Predictive Analytics:

Any combination of statistical techniques that take current and/or historical information and draw conclusions about what might happen in the future. Sometimes used interchangeable with “predictive modeling,” but can also refer to decision modeling, forecasting, optimization.

Predictive Modeling: The process of using statistical methods to analyze a series of variables and assign a score of how likely that series is to produce a certain result. Model scores can come in the form of probabilities, rankings, or groupings. Predictive modeling can rely on various statistical techniques, with or without the use of machine learning (logistic regression, naïve Bayes, decision trees, neural networks, etc).



Prescriptive Analytics:

The combination of statistics and computer science to take current and historical information and not only measure the probability of an event but also recommend actions to increase or decrease that probability.



Artificial Intelligence (AI):

The general concept of a machine that can perceive its environment and take some sort of action accordingly. AI has long described a machine's ability to think convergently—deductive thinking that leads to a single right answer to a problem; new frontiers in AI involve its ability to think divergently—creatively generate multiple answers to a problem.

Machine Learning: A currently popular application of AI, in which a computer is able to “learn” without being given a specific algorithm. Examples include decision trees, neural networks, clustering, Bayesian networks.

A “Hit” and Miss Business

Predictive Analytics Is Getting More Predictive—Even in Unlikely Terrains

Recording Industry Open to Large Potential Gains from Predictive Analytics



Big Industry

\$8.72B

Spent by music consumers in 2017

Low Conversion Rate

10%

Songs published by major labels that make the Billboard Top 100

High Stakes

\$543K

Revenue from Drake’s “In My Feelings” during first week at #1

2003

“Hit Song Science”

- Predictive model built on 23 internal variables
- Predicted unlikely commercial success of Norah Jones’s “Come Away With Me” record

2008

HSS Debunked

- Academic study finds that hit songs *cannot* be predicted because market forces are too powerful

2015

New Model Emerges

- Team of data scientists develop new model using 139 variables
- Built using Echo Nest
- Predicts dance songs at ~70% accuracy

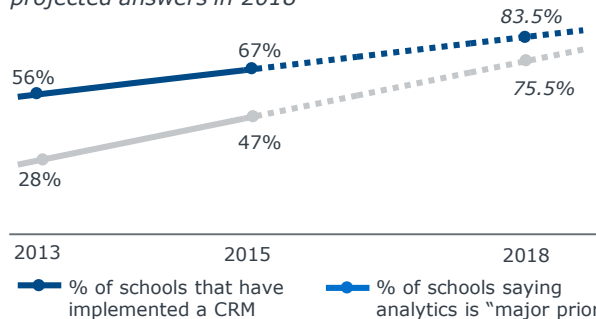
Sources: Elbers, Anita, et al, “Polyphonic HMI: Mixing Music and Math,” *Harvard Business School*, 2006; Chesman, Donna-Claire. “How Drake’s ‘In My Feelings’ Generated \$543k Last Week,” *DJBooth.net*, 26 July 2018; Christman, Ed. “U.S. Music Industry Hits Highest Revenue Mark in a Decade,” *Billboard.com*, 22 Mar 2018; Patchet F., and Roy, P. “Hit Song Science Not Yet a Science,” *Proceedings of ISMIR*, 2008; Neal, Meghan, “Machine Successfully Predicted the Hit Dance Songs of 2015,” *Motherboard.com*, 17 Dec 2015; EAB analysis.

Universities Are Investing in Analytics

And the Higher Ed Analytics Market is Growing Quickly

Growing Focus on Analytics Capability

Responses to Educause surveys in 2013 and 2015, projected answers in 2018



2 in 10 schools planning to double analytics budget in 12-18 years

Proliferation of Higher Ed Analytics Products



Sources: Yanosky, Ronald, et al, "The Analytics Landscape in Higher Ed, 2015," Educause, 2015; ibid, "The Analytics Landscape in Higher Ed, 2013," Educause, 2013; "What Will It Take to Build an Analytics-Driven Campus?" Ellucian, 2018; EAB analysis.

Two-Year Space A Whole Different Ballgame

Differentiated Enrollment Cycle Calls into Question the Value of Analytics...



Hyper-local market (with the exception of some online programs) cuts down size of prospect pool



Little control over tuition setting and discounting pits burden on other marketing strategies



Fewer opportunities for formal inquiries results in large numbers of stealth applicants

...and Technological Capabilities Lag Behind

35%

Percentage of Two-Year public institutions with Customer Relationship Management (CRM) Solutions

“

“Implementing a CRM is overwhelming! Not only is the technology expensive, but you need the people and processes behind it. We’re aiming to get there, but it won’t happen tomorrow.”

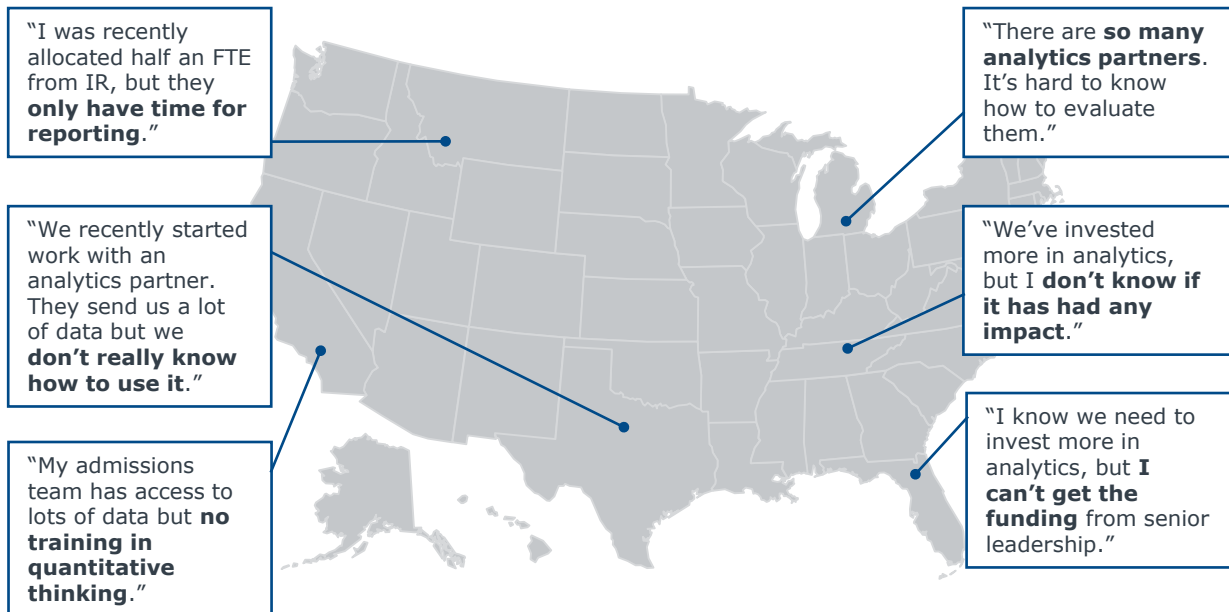
Director of Marketing
Community College (Midwest)

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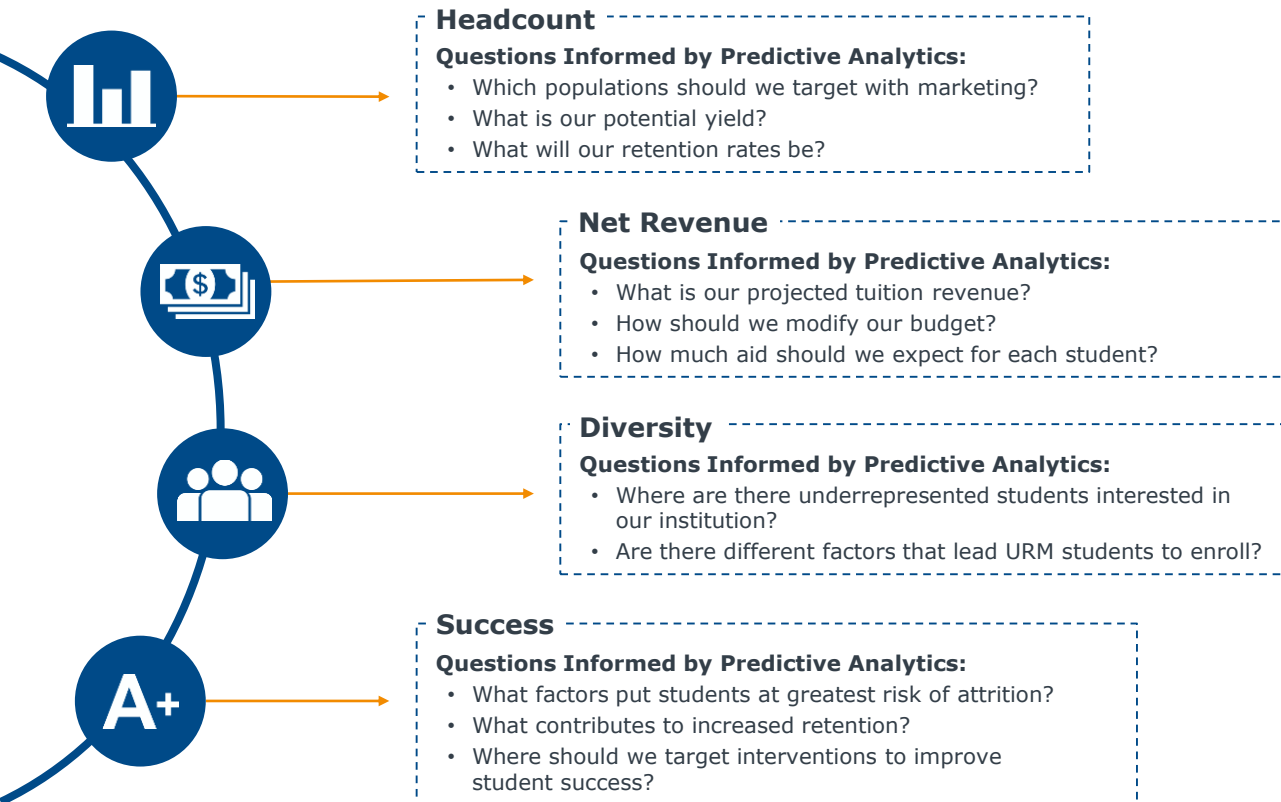
Enrollment Leaders Unsure How to Proceed



Heard in the Research

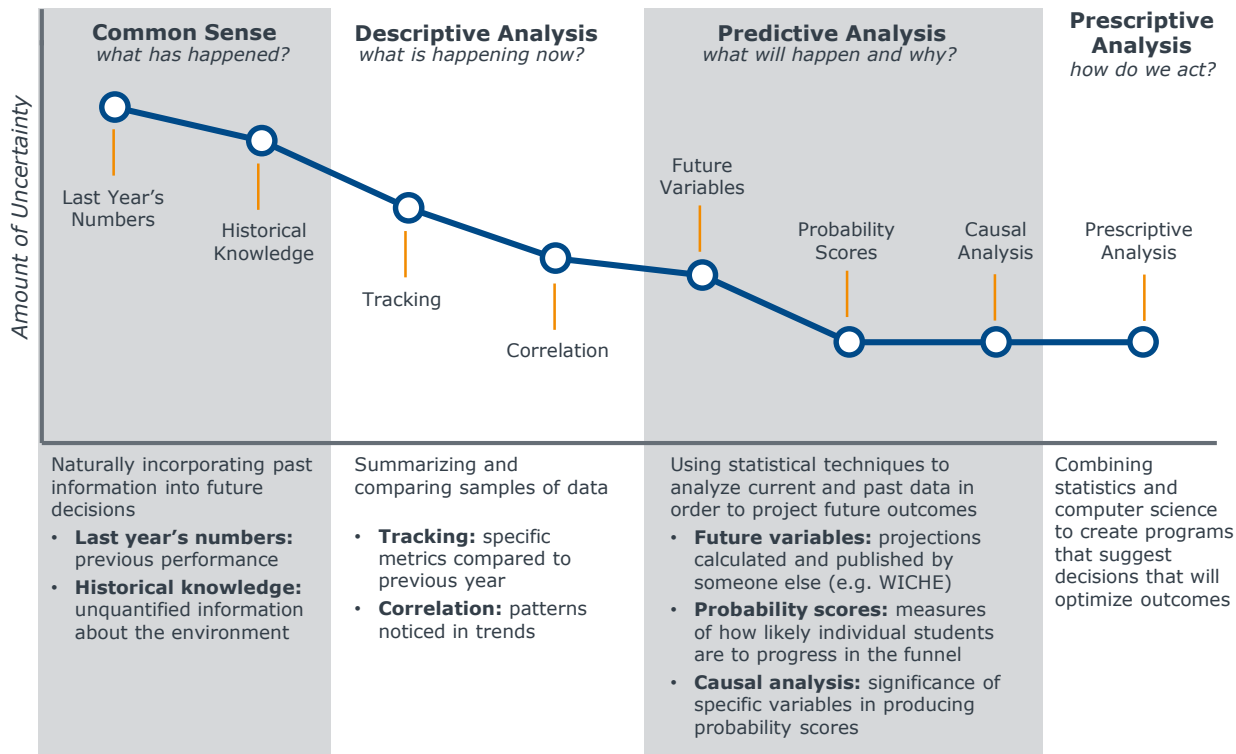


Predictive Analytics Aids Cross-Campus Efforts



We've Always Been in the Prediction Business

New Tools Just Reduce the Size of the Error Bar



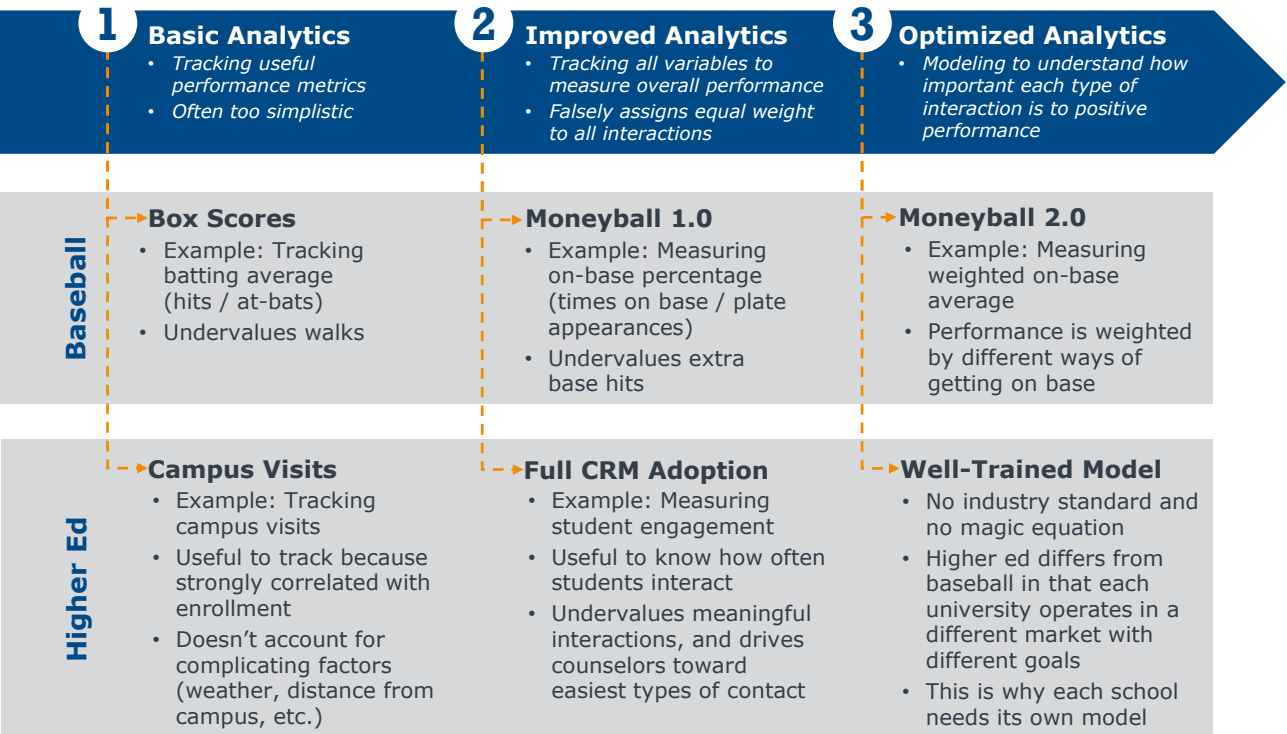


Analytic Thinking

CODA

Schrodinger's Analytics

What You Measure Matters



Beware the Anecdote



14

Rigor—Qualitative or Quantitative—Protects Against Common Analytical Errors

Common Analytical Errors

1 Information Bias

When you know more about one thing than another thing, it's easy to rationalize away undesirable information because you have more

2 Confirmation Bias

When you believe a certain outcome will happen, it's easy to interpret the evidence in a way that justifies your prognostication

3 Recency Bias

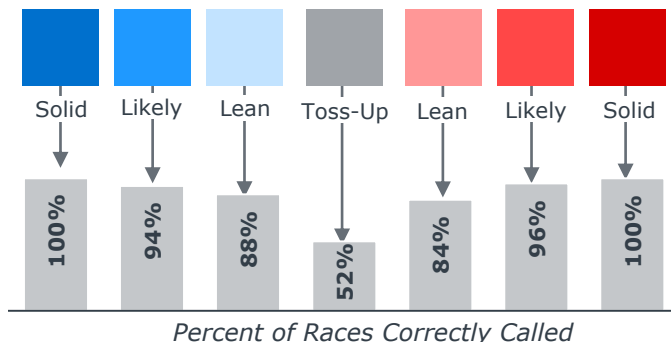
It is valuable to weight more recent evidence more strongly, but frequently people overweight the most recent thing they heard

Rigor in Qualitative Analysis

Cook —TV— POLITICAL ★ REPORT



Cook Grades Every Political Race on a 7-Point Scale



Think Probabilistically

Calibrate Decisions to the Probability of an Outcome



Binary Thinking

Understanding future outcomes and events in absolute or deterministic terms



Probabilistic Thinking

Understanding future outcomes and events in terms of their probability of happening

Probabilistic Thinking Helps You Determine How to Invest in a Decision

High Probability of Success



Player 1

Middling Probability of Success



Player 2

No Probability of Success



Player 3

1st Round of Betting



2nd Round of Betting



3rd Round of Betting



Reduce Uncertainty with Aggregation

Group Students Together in Larger Samples to Better Forecast Outcomes

Two Coin Flips: Four Possible Outcomes



Larger Sample Size Decreases Margin of Uncertainty

Possible Sequences (and Probabilities) for X Number of Heads from Ten Coin Flips

0	1	2	3	4	5	6	7	8	9	10
1	10	45	120	210	252	210	120	45	10	1
0%	1%	4%	12%	21%	25%	21%	12%	4%	1%	0%

66% chance of flipping heads between 4 and 6 times

→ 100 Flips Increases Sequences—and Certainty

- >1.2 nonillion¹ individual sequences
- >96% probability of the sequence falling between 40 and 60 heads
- For the equivalent uncertainty (1/3) of getting between 4 and 6 heads in 10 flips, the range would be just 46-54 heads out of 100 flips.

1) 1 nonillion is 1 followed by 30 zeros. The word means a number significantly greater in British English.



Next Steps for the Collaborative

CODA

How Can Predictive Analytics Help Us?



Stated Questions and Goals From Our 2-Year Members

Benchmarking

"I want to have a sense of **what is good yield**? What targets should I be setting for each of the populations we are serving?"



Maximize Staff Effectiveness

"Our IR department generates reports, but they're not the ones using this information on the ground. We need to increase **the ability of our student-facing folks to be able to use the data.**"

Maximizing New Populations

"We can track high school students, but **how do you recruit adults**? They're everywhere around you – what does predictive modeling look like with this population?"

Craft Campus Strategy

"We may have the data, but a lack of **system-wide understanding** around how to use it in a way that helps us move the needle is what's setting us back."

Predictive Modeling Self-Inventory

Questions You Should Be Asking About Your Model(s)

1 Do you have models that make predictions along the full cycle?

- ☒ Likelihood of Prospect to Apply
- ☒ Likelihood of Admit to Enroll
- ☒ Likelihood of Inquiry to Enroll (integrated into admission process)
- ☒ Likelihood of Inquiry to Apply
- ☒ Likelihood of Admit to Retain/Succeed

2 Are you updating model scores with strategic frequency?

- ☒ Do you re-score more frequently as you approach a decision date?
- ☒ Do you re-score every time you learn something new about a prospective student?

3 Are you incorporating these kinds of information into your model?

- ☒ Historical enrollment data
- ☒ Median income/wealth data
- ☒ Advanced behavioral data
- ☒ Historical student success data
- ☒ Demographic Projections

4 Do you know the predictive significance of the variables in your model?

- ☒ Can you calculate the enrollment impact of individual characteristics, behaviors, or campaigns?

5 Are you measuring or receiving reports on the accuracy of your model at least 1x/year?

- ☒ Do your score distributions show a monotonic increase?
- ☒ Do your top distribution bands predict at least the same number (if not more) conversions than the previous year?

We Want to Hear from You

What is your ultimate goal in implementing predictive modeling?

What's Next

Looking Ahead at the Predictive Enrollment Analytics Collaborative



Continuation of Agenda Setting and Research Calls

Discussion with a research expert to review your college's current analytics capabilities and enrollment goals



Midterm Update

Research team shares early findings; opportunities for group input to further research scope and direction



Results Webconference

Presentation of findings and practices, including input from community college thought leaders



Customized Service Plans

Tailored list of quick wins and toolkit of resources to address your college's enrollment analytics priorities and goals



Supporting You Every Step of the Way



Resources for Your Greatest Challenges



Marketing and Recruiting

NEW [How to Keep Community College Students in Your Pipeline](#) Infographic

NEW [Enrolling the Next Generation of Students](#) Onsite Presentation



Strategic Planning

[Strategic Planning Resource Center](#)

[Take the Pain Out of Strategic Planning](#)
Webconference



Student Success

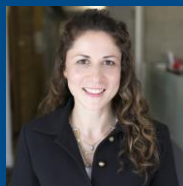
NEW [Closing the Part-Time Student Success Gap](#) Onsite Presentation

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