DAACS

Diagnostic Assessment & Achievement of College Skills

Using Diagnostic Assessment Data to Advance Student Success:
Results from the DAACS Project

Maryland Assessment Research Center Conference
November 7, 2019

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FIPSE FITW

- Fund for the Improvement of Postsecondary Education (FIPSE) First in the World (FITW) grant

- $3 million for 4-years

- Develop and research the Diagnostic Assessment and Achievement of College Skills

THE CHRONICLE OF HIGHER EDUCATION

Colleges Continue to Abandon Standardized Tests to Assess Learning, Survey Finds

Better Advising Beats Free Tuition for Improving Degree Completion, Say Experts

Stanford | GRADUATE SCHOOL OF **EDUCATION**

Stanford study shows college student coaching improves retention and graduation rates

| f Share | 130 | Tweet | 18 | in Share | 56 | Email | 49 | G+1 | 1 | f Like | 60 |

Print

Coaching is one of the more cost effective ways to improve retention and graduation rates, according to a new study 🔗 by Eric Bettinger and doctoral student Rachel Baker.

INSIDE HIGHER ED

Finding a New Compass

ACT decides to drop its popular Compass placement test, with a nod toward research showing that Compass funnels too many community college students into remedial courses.

http://chronicle.com/blogs/ticker/colleges-continue-to-abandon-standardized-tests-to-assess-learning-survey-finds/108683
http://chronicle.com/blogs/ticker/better-advising-beats-free-tuition-for-improving-degree-completion-say-experts/108756
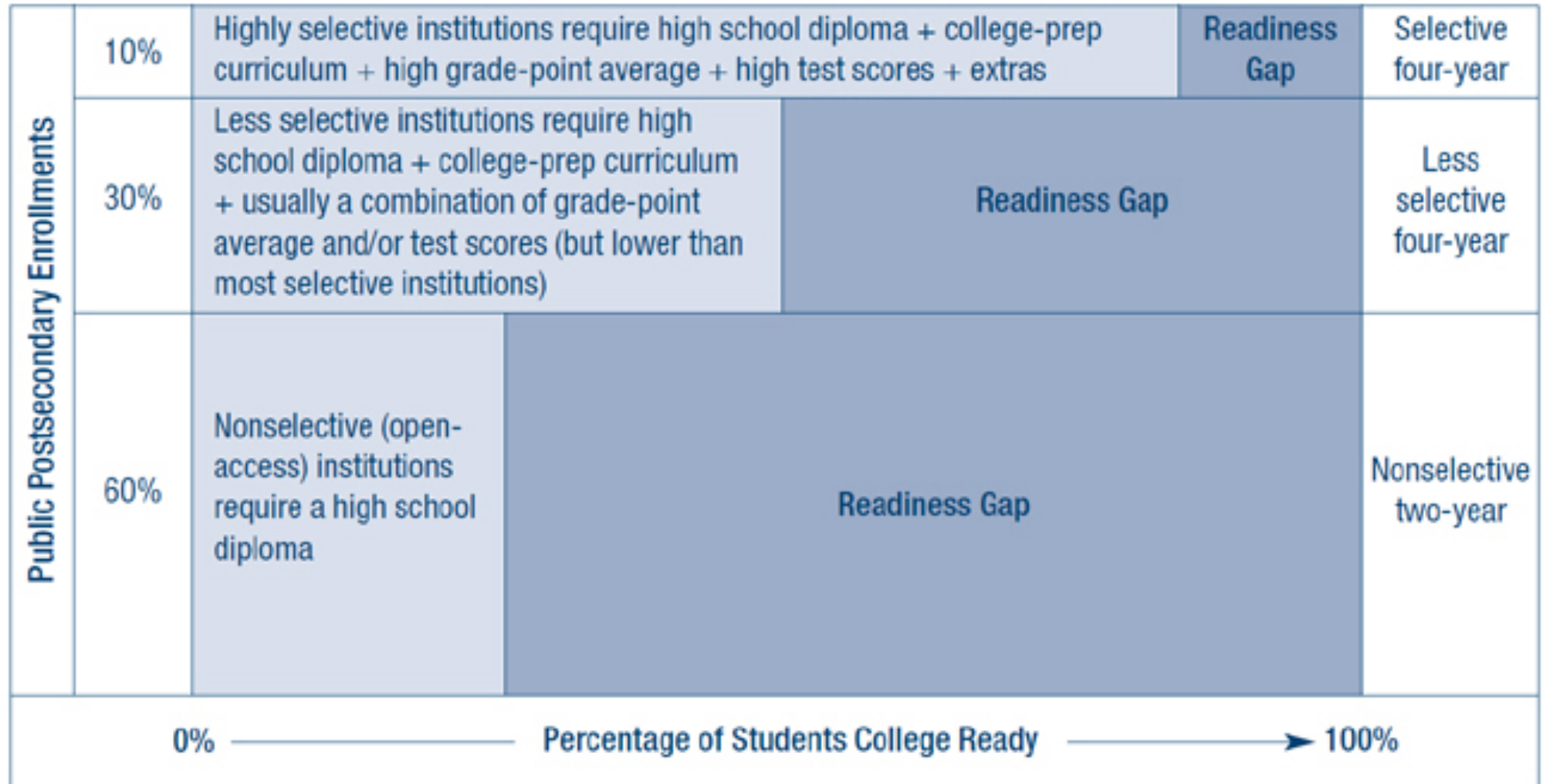https://ed.stanford.edu/spotlight/stanford-study-shows-college-student-coaching-improves-retention-and-graduation-rates
https://www.insidehighered.com/news/2015/06/18/act-drops-popular-compass-placement-test-acknowledging-its-predictive-limits

"[N]early 60% of first-year college students discover that, despite being fully eligible to attend college, they are not ready for postsecondary studies"

– The National Center for Public Policy and Higher Education

Figure 1: The Readiness Gap by Institutional Sector

Public Postsecondary Enrollments			
10%	Highly selective institutions require high school diploma + college-prep curriculum + high grade-point average + high test scores + extras	Readiness Gap	Selective four-year
30%	Less selective institutions require high school diploma + college-prep curriculum + usually a combination of grade-point average and/or test scores (but lower than most selective institutions)	Readiness Gap	Less selective four-year
60%	Nonselective (open-access) institutions require a high school diploma	Readiness Gap	Nonselective two-year

0% ———— Percentage of Students College Ready ————➤ 100%

High Stakes - "test scores are used to determine punishments (such as sanctions, penalties, funding reductions, negative publicity), accolades (awards, public celebration, positive publicity), advancement (grade promotion or graduation for students), or compensation (salary increases or bonuses for administrators and teachers)." [1]

Low Stakes - "used to measure academic achievement, identify learning problems, or inform instructional adjustments, among other purposes." [1]

Summative Assessment - "used to evaluate student learning, skill acquisition, and academic achievement at the conclusion of a defined instructional period—typically at the end of a project, unit, course, semester, program, or school year." [2]

Formative Assessment - "A range of formal and informal assessment procedures… undertaken by teachers in the classroom as an integral part of the normal teaching and learning process in order to modify and enhance learning and understanding" (Crooks, 2001)

[1] http://edglossary.org/high-stakes-testing/
[2] http://edglossary.org/summative-assessment/

What is DAACS?

- A suite of technological and social support to optimize student learning

- **No**-stakes, **formative** assessment

- Provides students with immediate feedback about strengths and weaknesses along with links to open educational resources (OER)

- Coaches, Academic Advisors, and Mentors can utilize student results to provide more targeted supports

- Data is used in predictive analytic efforts to increase the accuracy of identifying "at-risk" students
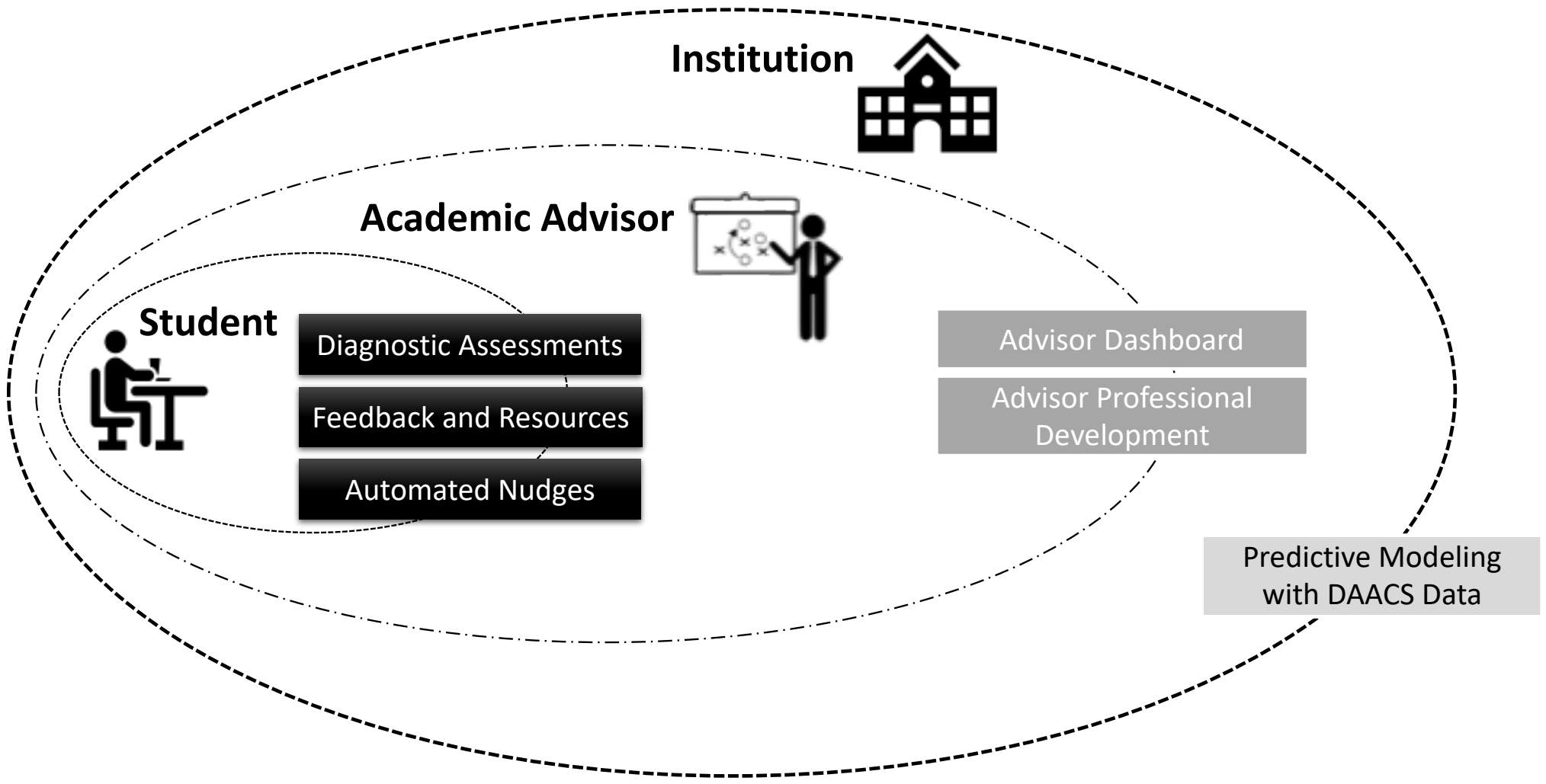
Institution

Academic Advisor

Student

Diagnostic Assessments

Feedback and Resources

Automated Nudges

Advisor Dashboard

Advisor Professional Development

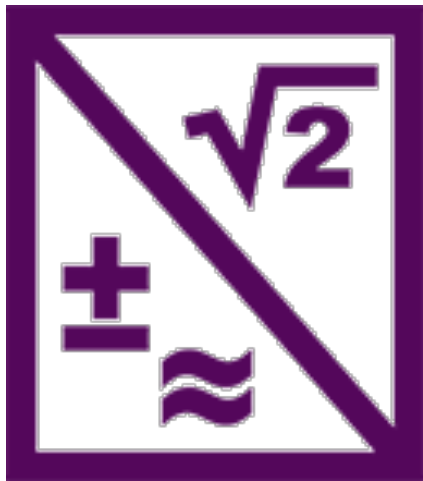Predictive Modeling with DAACS Data

You Get What You Assess

Self-Regulated Learning

Metacognition (planning, monitoring, evaluation)

Motivation (mindset, self-efficacy, anxiety, mastery orientation)

Strategies (for understanding, for managing learning)

Reading

Ideas
Inference
Language
Purpose
Structure

Mathematics

Word Problems
Geometry
Statistics
Variables & equations
Number and calculation
Lines & Functions

Writing

Content
Organization
Focus on main idea
Connecting ideas
Sentences
Conventions

An Open Source Solution

- **Self-Regulated Learning** is assessed using a new instrument drawn from existing SRL measures

- **Mathematics** and **Reading Comprehension** items were drawn from NYS Regents Exams and the Massachusetts Comprehensive Assessment System. These exams are given in high school and are designed to indicate college readiness

- **Writing** assessment is scored using the open source LightSide machine learning software

- The software platform is available on Github and licensed using an open source license

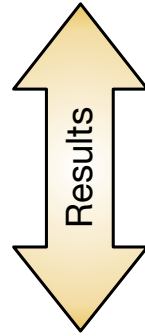# Connecting Students to Open Educational Resources (OERs)

College Skills - Built into the DAACS feedback but a stand alone website is available (srl.daacs.net)

Mathematics - Lots of OERs already exist (e.g. Math Is Fun)

Writing - Excelsior College's Online Writing Lab (owl.excelsior.edu)

Reading - We extended Excelsior's OWL to include a robust reading comprehension section

Students

Results

Assessments

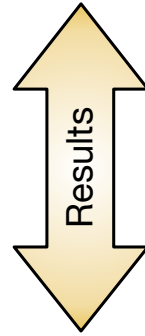Self-Regulated Learning

Writing

Mathematics

Reading

Treatment Components

Diagnostic Assessments

Students

Results

Assessments

Self-Regulated Learning Writing Mathematics Reading

Nudges

Feedback

Open Educational Resources

Treatment Components

Diagnostic Assessments
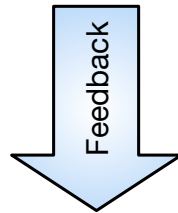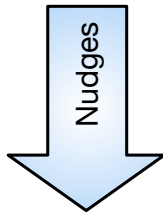
Feedback & Resources
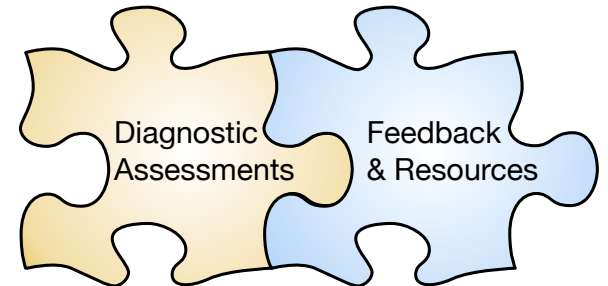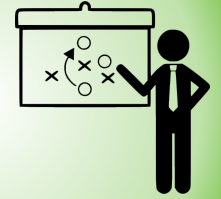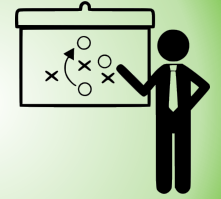
Students

Advising / Tailored Interventions

Academic Advisors

Results

Advisor Dashboard

Assessments

Self-Regulated Learning

Writing

Mathematics

Reading

Nudges

Feedback

Open Educational Resources

MATH is FUN

Treatment Components

Advising / Coaching

Diagnostic Assessments

Feedback & Resources

demo.DAACS.net

Research Questions

1. What is the effect of DAACS on students' early credit acquisition, retention, and academic achievement, as compared with students that do not use the tool?

2. To what extent does the inclusion of DAACS results in predictive analytic models increase the accuracy of identifying "at-risk" students (here defined as non-retained students)?

Methodology
Randomized Control Trial (RCT)

- The sample included 17,687 incoming undergraduate students from two private, nonprofit, online colleges who enrolled between April 15, 2017 and December 31, 2017. Both institutions serve predominately non-traditional first-generation college students

  - Institution A (n = 5,119), average age is 35.29 (SD=9.47)

  - Institution B (n = 12,568), average age is 33.6 (SD=8.93)

- Outcome measures:

  - On-time progress

  - Credits earned-to attempted

  - Accuracy of predictive models
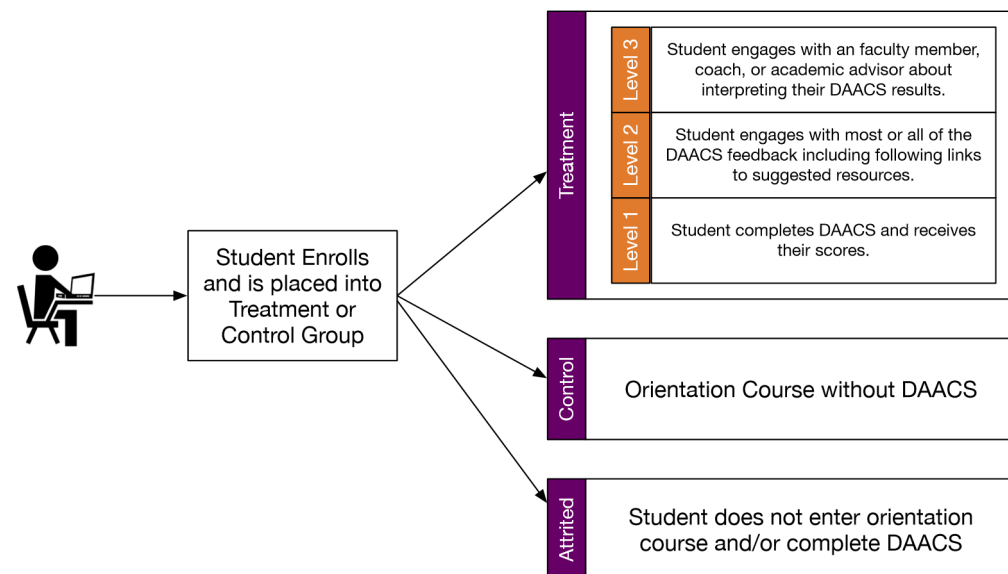
Results

On-time progress (chi-squared test)
- Institution A: $\chi^2 = 0.31$, $p > 0.05$
- Institution B: $\chi^2 = 3.38$, $p > 0.05$

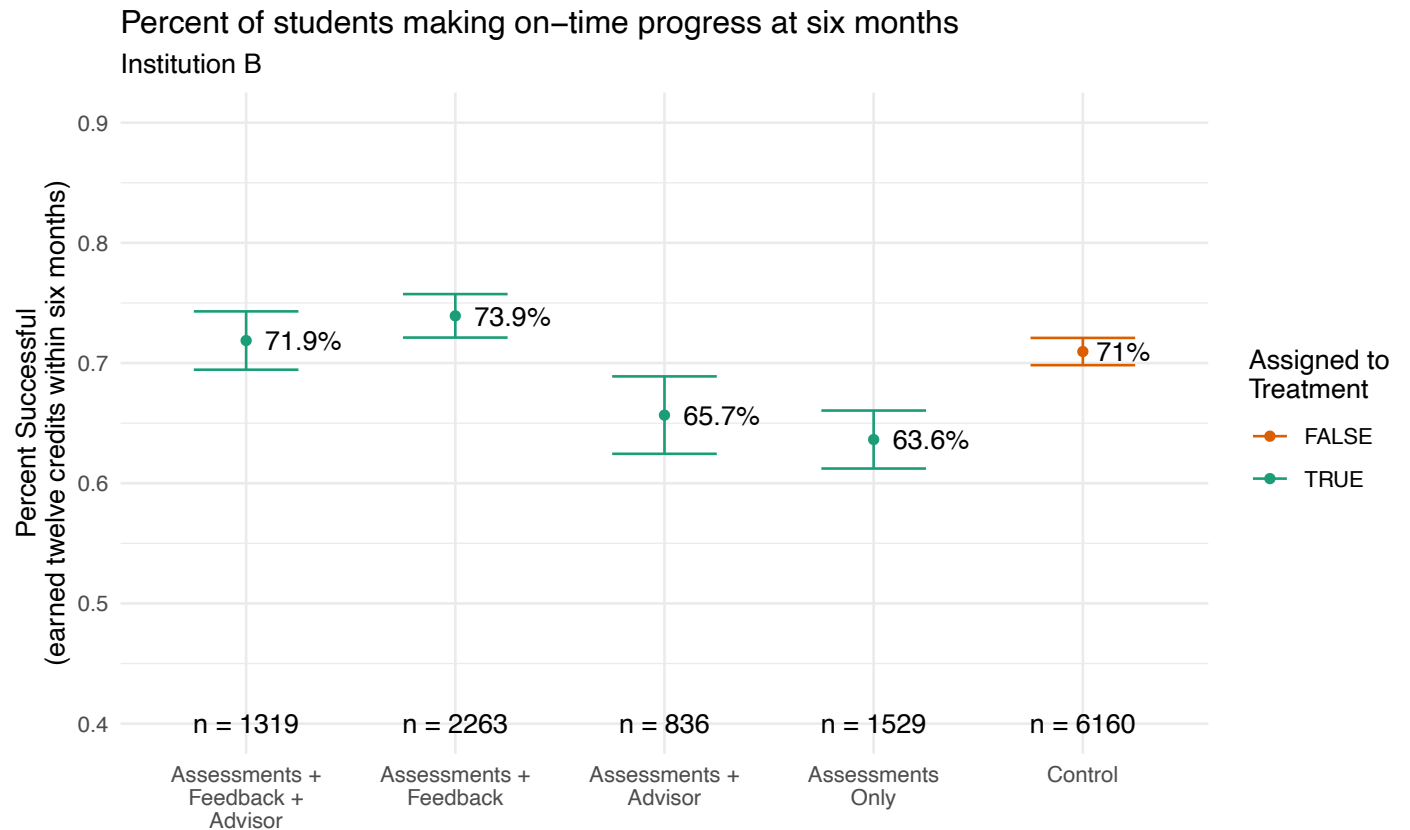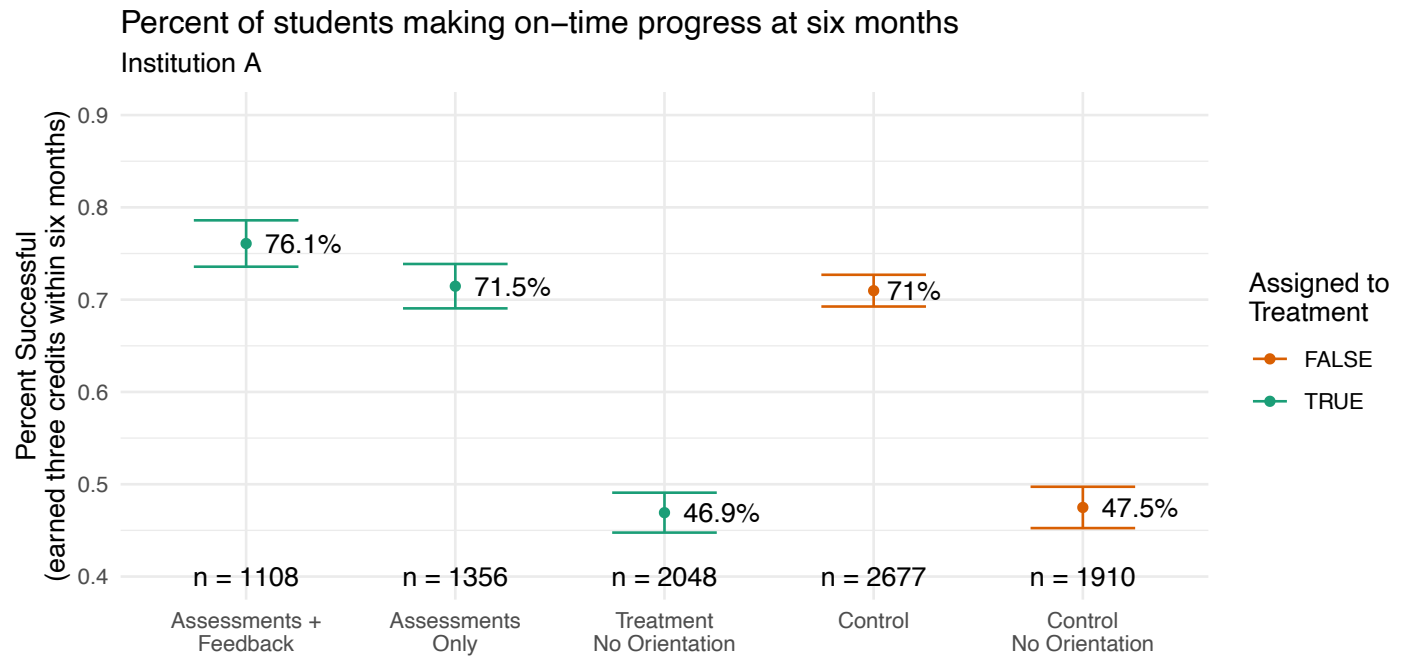Course success rate (credits earned-to-attempted; t-test)
- Institution A: $t_{3504} = -0.37$, $p > 0.05$
- Institution B: $t_{12495} = 1.13$, $p > 0.05$

Measure	Institution A[a]	Institution B	
Component: Assessments			
Students who completed at least one assessment and viewed only the results pages.	28.8% ($n = 723$)	25.9% ($n = 1600$)	
Component: Student use of Feedback and OERs			21.9% ($n = 1352$) *Received both components*
Students who feedback pages and/or clicked links to external OERs	22.7% ($n = 569$)	38.2% ($n = 2360$)	
Component: Academic Advisors			
An academic advisor viewed student's results	1.2% ($n = 30$)	14.0% ($n = 862$)	
Component: Predictive Modeling[b]			
Increase in model accuracy between by adding DAACS results to baseline student predictor variables (e.g. demographics, transfer credits, etc.)	Classification Tree: 6.0%	Classification Tree: 4.0% Logistic Regression: 3.4%	

[a]1,189 (47.4%) of students assigned to the treatment group at Institution A did not receive any part of the DAACS intervention.
[b]Due to data limitations, logistic regression could not be run at Institution A.

Results: On-Time Progress

Percent of students making on–time progress at six months
Institution A

Percent of students making on–time progress at six months
Institution B

Results: Credit Ratio

Credits earned–to–attempted within six months
Institution A
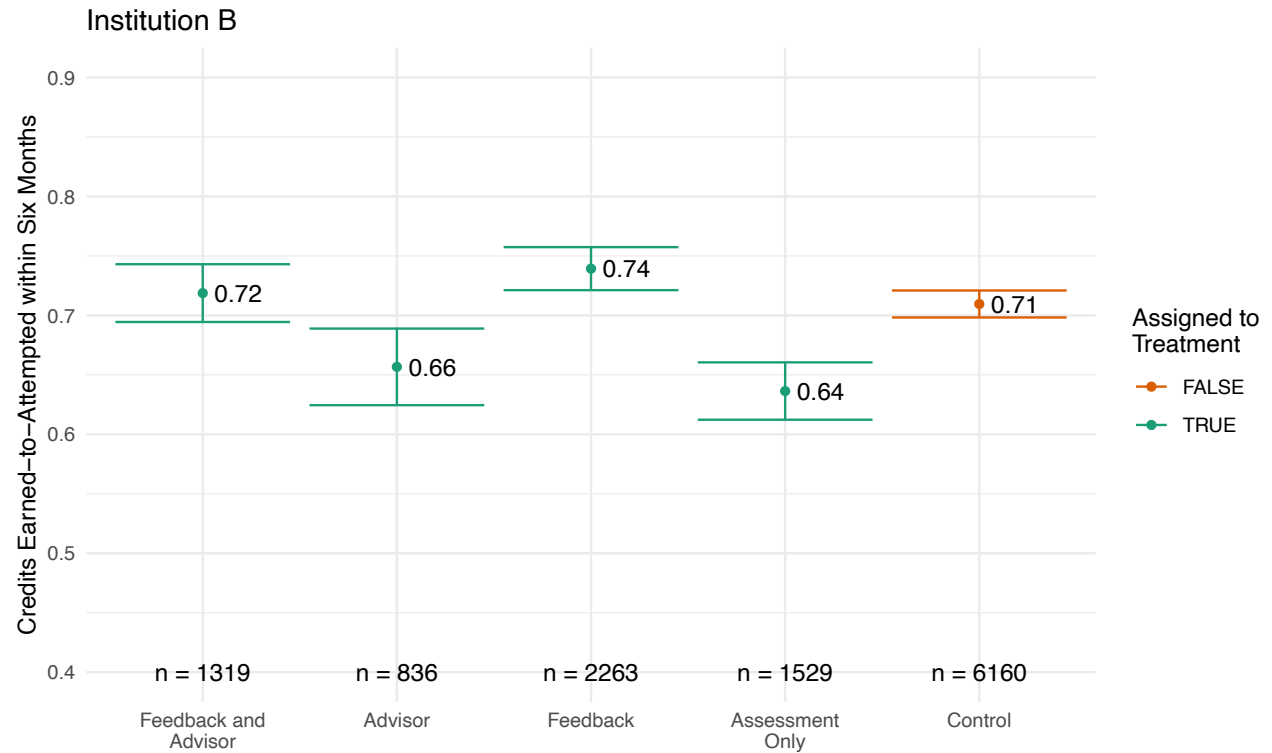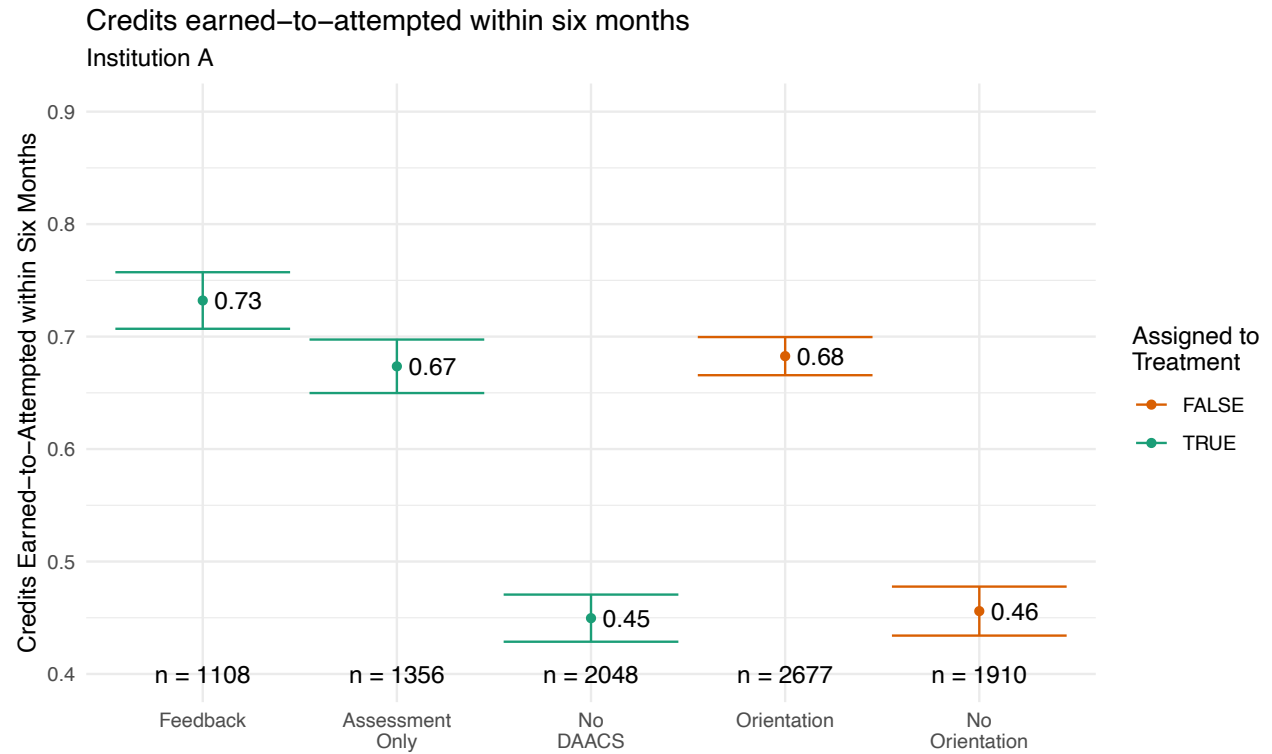
Institution B

Predicting Student Success

- Predicting number of credits students earn within two months with the following covariates: DAACS domain results, gender, ethnicity, age, first generation, employment status, and household income.

- Institution A:

  - Classification trees: 6.0%

- Institution B:

  - Classification trees: 4.0%

  - Logistic regression: 3.4%

Purposes of the Writing Assessment

1. Evaluate students' writing skills

2. Give students targeted, actionable feedback about critical elements of their writing

3. Direct students towards relevant writing resources

4. Assist students in reflecting on their DAACS results and committing to a course of action related to their self-regulated learning

5. Provide supplemental information to academic advisors about students' strengths and weaknesses in terms of SRL.

This writing assessment is not designed to place students, nor to measure their growth in writing ability.

✎ Assessment: **Writing**   **Jason Bryer** ⏷

Writing

You received information about your learning skills after you took the self-regulated learning (SRL) survey, as well as suggestions for becoming a more effective and efficient learner. Now, in order to reflect on your learning skills and receive feedback on your writing, please use the results from your SRL survey to do your best writing in a brief essay that answers the questions below.

You will need to refer to your SRL survey results and feedback in your essay. We recommend reviewing them, taking notes, and then returning here to write.

Essays must be at least 350 words in order to be meaningfully scored. Please aim to write a complete, well-developed essay in order to get accurate feedback about how ready you are for academic writing, and what you can do to strengthen your writing skills.

- What do your self-regulated learning survey results and the feedback tell you about your learning skills? Use results from the survey and the feedback to support your analysis.

- Which suggested strategies from the feedback are you committed to using this term? Explain why you are committed to using those strategies.
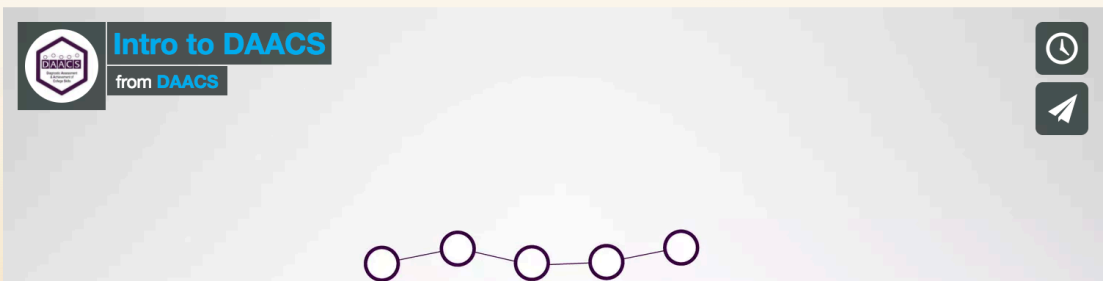
✎ Helpful Tips

- What do your self-regulated learning survey results and the feedback tell you about your learning skills? Use results from the survey and the feedback to support your analysis.

- Which suggested strategies from the feedback are you committed to using this term? Explain why you are committed to using those strategies.

- The assessment is not timed and you can stop and return later to complete it.

- You can view the directions and scoring criteria by clicking the *help* button while writing the essay.

Intro to DAACS
from **DAACS**

🕐

✈

HELP   CONTINUE LATER   NEXT

The Writing Assessment

- 1,093 essays, 551 were double scored.

- LightSide was turned on on June 15th providing students with writing feedback in approximately one minute.

- SUCCESS! The writing assessment looks to be an important part of the intervention. Student responses have been earnest, reflective, and engaging in the SRL process.

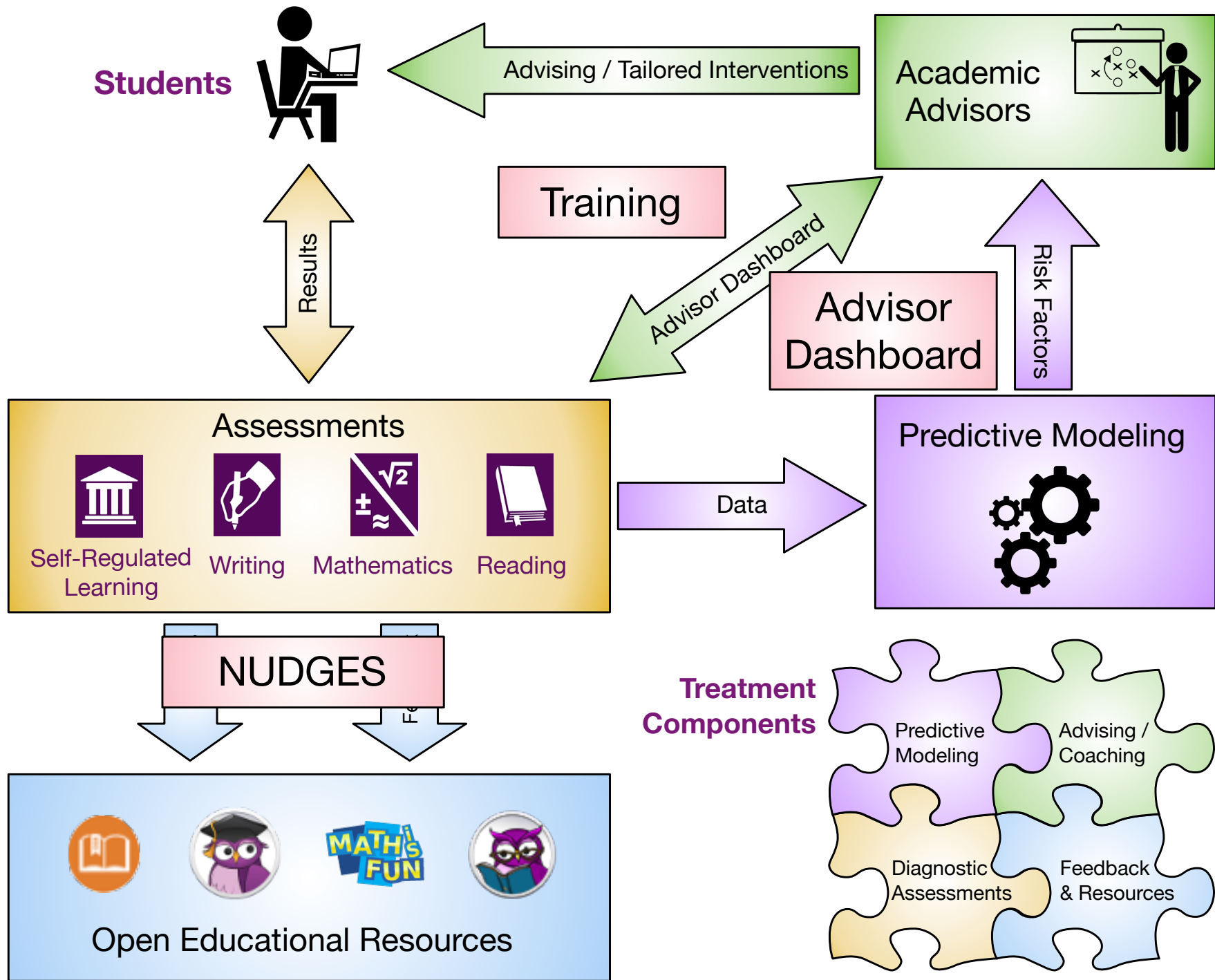| Criteria		Developing (1)	Emerging (2)	Mastering (3)
Content	**Summary**	The discussion of the survey and feedback is vague, poorly grounded in the survey results and feedback, and/or simplistic.	The essay uses evidence from survey results and feedback to summarize student's strengths and weaknesses in terms of self-regulated learning. The summary lacks sufficient detail; might be under-developed in places, e.g., strengths or weaknesses might get short shrift.	The essay uses relevant survey results and feedback to provide a detailed summary of both the student's strengths <u>and</u> weaknesses in terms of self-regulated learning.
	Suggestions	Choices of suggestions to which to commit are vague, if present at all, and/or only loosely connected to the survey results and feedback, if at all. The essay might refer to the continued use of current strategies but not to anything new related to the SRL feedback.	Choices of suggestions to which to commit are discussed. The connections to the survey and feedback are present but might not always be explicit.	The discussion of suggestions for improvement in SRL are logically and explicitly related to the survey results and feedback, and developed in sufficient depth.
Organization	**Structure**	The structure and order of the essay is weak, unclear, and/or illogical.	The essay has a general structure and order but may not have a clear overall organization that enables a reader to follow the progression of one idea to another. Although the structure is logical, it might seem haphazard at times. Note: One-sentence paragraphs do not necessarily reflect a problem with organization, but numerous such paragraphs might signal a weak or haphazard structure.	The essay is well-organized, with an order and structure that present the discussion in a clear, logical manner.
	Transitions	Transitions between paragraphs are missing or ineffective; paragraphs tend to abruptly shift from one idea to the next. Note: One-paragraph essays receive a 1 for this criterion.	Paragraphs are usually linked with transitions, as needed. The transitions might be implied or strained, but the reader can follow along.	Transitions between paragraphs are appropriate and effective, and strengthen the progression of the essay (e.g. "The second aspect . . ." "The last aspect . . ." and/or the repetition of important ideas and terms to connect paragraphs).
Paragraphs	**Focus on a Main Idea**	Most or all paragraphs lack one clear, main point; might have several topics. Note: Numerous brief paragraphs of one or two sentences each might indicate a problem with paragraph focus and warrant a score of 1.	Paragraphs are generally but not consistently focused on a main idea or point. Some paragraphs might lack a clear focus in an essay in which the majority of paragraphs maintain a clear focus on a main idea.	Paragraphs are consistently and clearly focused on a main idea or point.
	Cohesion	The connections between ideas in sentences within paragraphs are unclear. Little effective use of linking words and phrases.	The ideas or information in each sentence within a paragraph are generally but not consistently linked together, if only loosely. Additional or better choices of linking words and phrases would clarify the connections b/w ideas within paragraphs.	Within paragraphs, the individual sentences are seamlessly linked together; the reader can see the relationship between the ideas or information in one sentence and those in another sentence. The writing explicitly links sentences and ideas using adverbs (e.g., similarly, also, therefore), relative pronouns (e.g., who, that, which), conjunctions (e.g., and, or, while, whereas), and/or the repetition of key words, as appropriate.
Sentences	**Correct**	Significant syntax problems, such as fragments, run-on sentences, missing/extra words, awkward constructions, dangling modifiers, and/or transposed words, are present and numerous enough to distract readers and impede meaning.	Grammatically incorrect sentences, when present, are minor and do not interfere with meaning.	There are very few or no significant syntax problems. The writer is capable of managing even complex syntactic structures correctly.
	Complex	The sentences lack syntactic complexity and vary little, if at all, in structure. The sentences tend to be relatively simple in structure, following a basic subject-verb-object pattern perhaps with a few additional elements, such as brief introductory phrases, prepositional phrases, or modifiers.	Complex syntactic structures are present but may not always be managed effectively; sentence structures may be varied but are not often sophisticated.	Consistent and appropriate use of a variety of sentence structures, including sophisticated sentence structures, such as complex, compound, or compound-complex sentences, and other complex syntactic forms, such as extended participial phrases and relative clauses.
Conventions		A pattern of errors in spelling, punctuation, usage (such as incorrect word forms or subject-verb agreement), and/or capitalization suggest that the writer struggles with the rules for conventions.	Spelling, punctuation, usage, and capitalization are generally correct. There may be errors but there is no pattern that suggests that the writer struggles with the basic rules.	Spelling, punctuation, and capitalization are correct to the extent that almost no editing is needed. There are very few, if any, very minor errors of usage.

Results: Writing

Criteria	N	% Agreement
Content_Summary	594	57.91
Content_Suggestions	595	58.32
Organization_Structure	595	62.86
Organization_Transition	592	57.77
Paragraphs_Focus_on_a_Main_Idea	594	61.78
Paragraphs_Cohesion	595	69.83
Sentences_Correct	595	55.13
Sentences_Complex	595	58.49
Conventions	595	55.29

	Summary	Suggestions	Structure	Transition	Focus	Cohesion	Correct	Complex	Conventions
Model	Logit	Logit	Bayes	Bayes	Logit	Logit	Logit	Bayes	Logit
Accuracy	69.92	72.26	74.22	47.17	73.45	72.73	55.73	68.42	63.16
Kappa	0.4179	0.4912	0.3413	0.1483	0.1276	0.2451	0.073	0.361	0.159
Bad Error	0.05	0.06	0.01	0.04	0.12	0.01	0.07	0.003	0.04

Next Steps…

- Currently developing an advisor dashboard (see https://dashboard.daacs.net) to provide a streamlined view of student results.

- New SRL Lab: https://srl.daacs.net

- Developing more robust training materials

- Student nudges to: (a) complete DAACS and (b) review their feedback
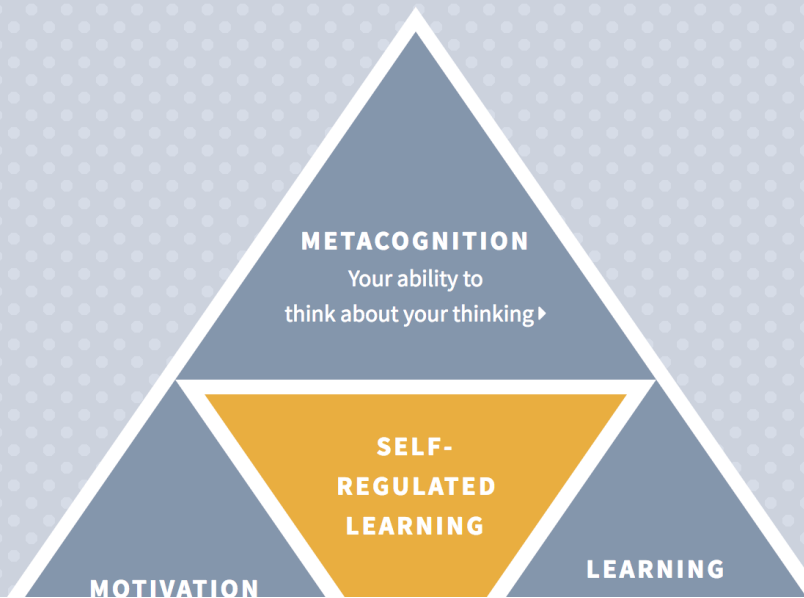
http://srl.daacs.net

http://127.0.0.1:5218 | Open in Browser | Publish

DAACS Dashboard

- Overview
- SRL
- Mathematics
- Reading
- Writing

Student: Jason Bryer

72%	22%	22%	72%
0 SRL 100	0 Math 100	0 Reading 100	0 Writing 100

Challenges

Challenge	Strategies	Resources
Fixed Mindset	* View mistakes as a natural part of learning. * Remind yourself that you can improve if you just keep trying.	* http://srl.daacs.net/mindset.html * Dweck's TED Talk: https://vimeo.com/207330839
High Anxiety	* Use relaxation techniques * Say positive things to yourself * Create schedules and plan study times	* http://srl.daacs.net/anxiety.html * Anxiety & Depression Association of America: https://www.adaa.org/living-with-anxiety/children/test-anxiety

Strengths

Strength	Strategies	Resources
High Self-Efficacy	* Use positive self-talk * Remind yourself of all of the things that you do well in school.	* Watch the video at: http://srl.daacs.net/self-efficacy.html
Good Strategies for Understanding	* Study over several short study sessions * Use practice quizzes or tests * Use concept maps or make summaries.	* http://srl.daacs.net/understanding.html'

https://dashboard.daacs.net

JASON BRYER

DAACS Summary Report

DAACS
Diagnostic Assessment & Achievement of College Skills

OVERALL RESULTS

Self-Regulated Learning ●●○
Writing ●●●
Mathematics ●●○
Reading ●○○

SELF-REGULATED LEARNING

📅 Completion Date: April 07, 2019

Motivation ●●●
Strategies ●●○
Metacognition ●●○

MATHEMATICS

📅 Completion Date: September 24, 2019

Word Problems ●○○
Lines And Functions ●○○
Variables And Equations ●●○
Number And Calculation ●●○
Statistics ●●○
Geometry ●●○

WRITING

📅 Completion Date: June 13, 2019

Content ●●●
Organization ●●●
Paragraphs ●●●
Sentences ●●●
Conventions ●●●

READING

📅 Completion Date: April 07, 2019

Structure ●○○
Inference ●●○
Language ●●○
Purpose ●●○
Ideas ●○○

WHAT IS DAACS?

The Diagnostic Assessment and Achievement of College Skills (DAACS) is a suite of technological and social supports to optimize student learning. DAACS provides personalized feedback about students' strengths and weaknesses in terms of key academic and self-regulated learning skills, linking them to the resources to help them be successful students. Visit www.DAACS.net for more information.

WHAT ARE MY RESULTS?

DAACS is a *diagnostic* assessment designed to provide information about your readiness for college work. Your results indicate whether your colleges skills are at the *developing* (one dot), *emerging* (two dots), or *mastering* (three dots) level.

STRENGTHS

conventions   mastery orientation

CHALLENGES

lines and functions   ideas   anxiety

HOW CAN I IMPROVE?

A number of strategies and resources are available when you login to the DAACS system. To improve your self-regulated learning skills, we recommend the SRL Lab (https://srl.daacs.net). Excelsior College's Online Writing Lab (https://owl.excelsior.edu) and Online Reading Comprehension Lab (https://owl.excelsior.edu/orc) are great resources for writing and reading, respectively.

Questions

Thank You!

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Websites: www.DAACS.net
         demo.DAACS.net
         dashboard.DAACS.net

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FIPSE