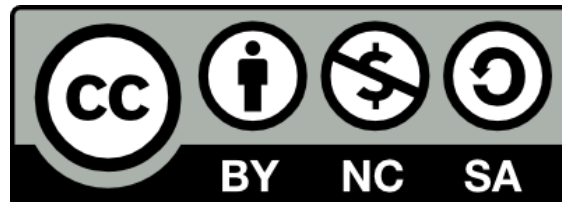




SYMPOSIUM ON LEARNING ANALYTICS AT MICHIGAN



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Expert Electronic Coaching for STEM Education

A large, tiered lecture hall filled with students attending a lecture. The students are seated in curved rows, facing the front of the hall. Many students are looking towards the front, and some are taking notes. The hall is well-lit, and the students are dressed in casual attire.

How learning analytics and computer tailored communications enable us to provide individualized feedback, encouragement, and advice to thousands of students

Challenges in STEM education

- PCAST calls for 1M more STEM majors over 10 years – a 35% increase
- Nationwide, only 40% of those intending STEM majors complete them
- The largest loss occurs during two years of large introductory courses

REPORT TO THE PRESIDENT
ENGAGE TO EXCEL: PRODUCING ONE MILLION
ADDITIONAL COLLEGE GRADUATES WITH
DEGREES IN SCIENCE, TECHNOLOGY,
ENGINEERING, AND MATHEMATICS

Executive Office of the President
President's Council of Advisors
on Science and Technology

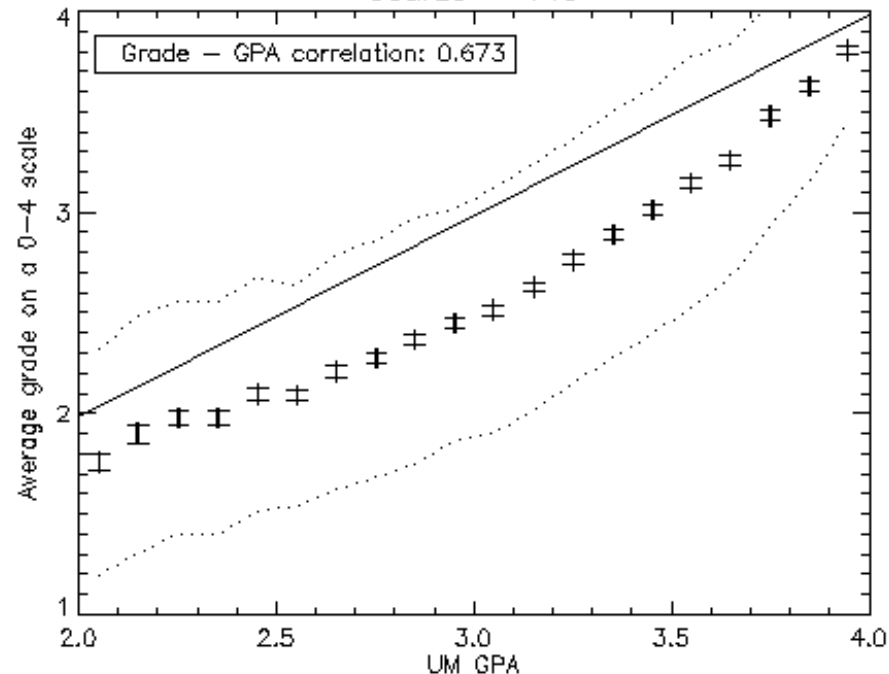
FEBRUARY 2012

http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-engage-to-excel-final_feb.pdf

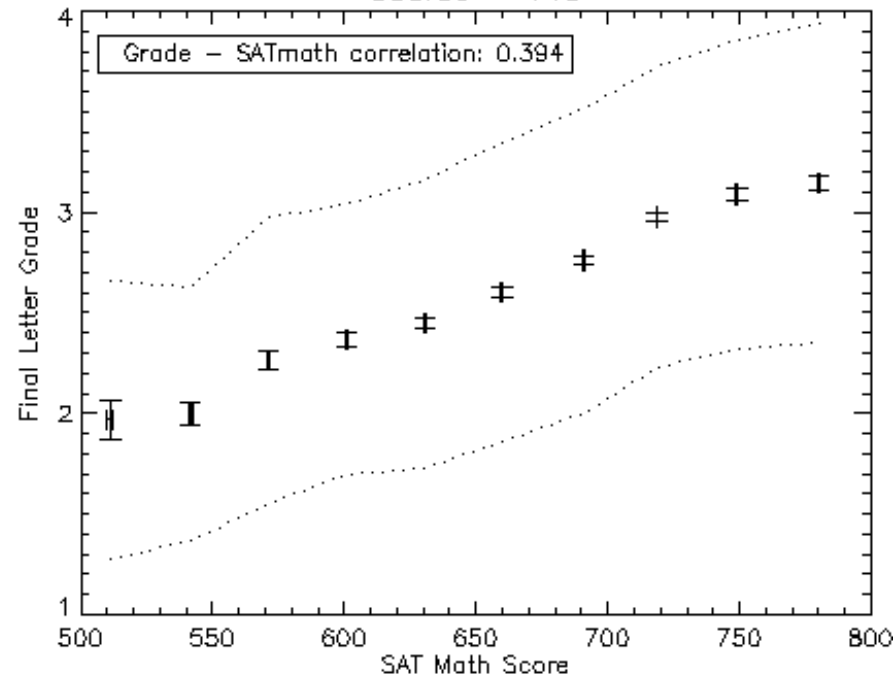
STEM attrition: in LSA less than 50% of those arriving intending STEM complete

- Students arrive in college with context specific diversity of background, interest, and identity
- STEM intro courses are large, uniform, and challenging
- All these factors lead to attrition: *departure from STEM is not primarily due to failure*
- Personalization: provide support able to act on Background strengths and weaknesses
Interests, future goals, and affect
Real-time status, including metacognitive state
- Personalization must be done accurately, wisely, and at scale

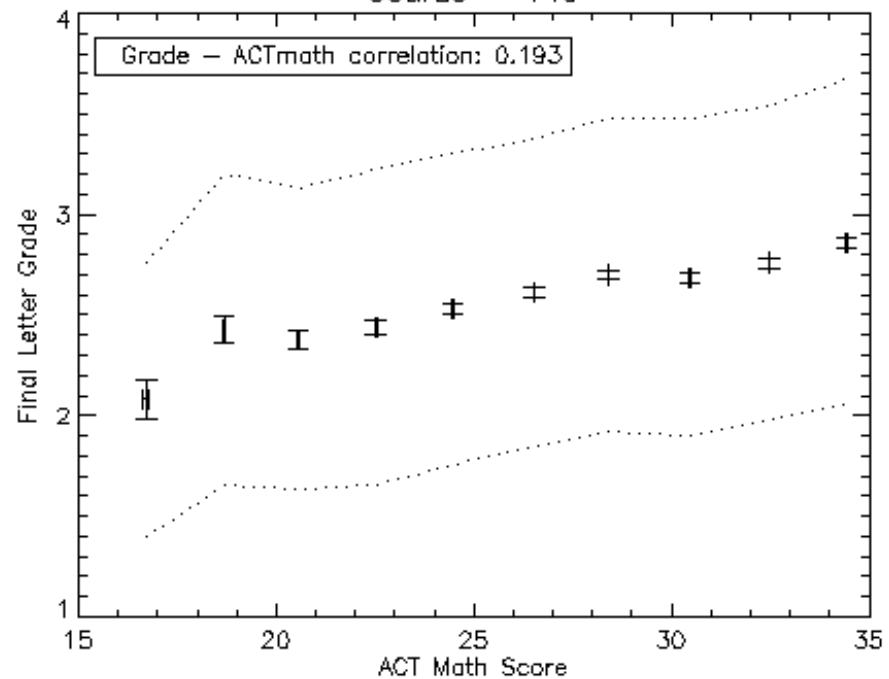
Course = 140



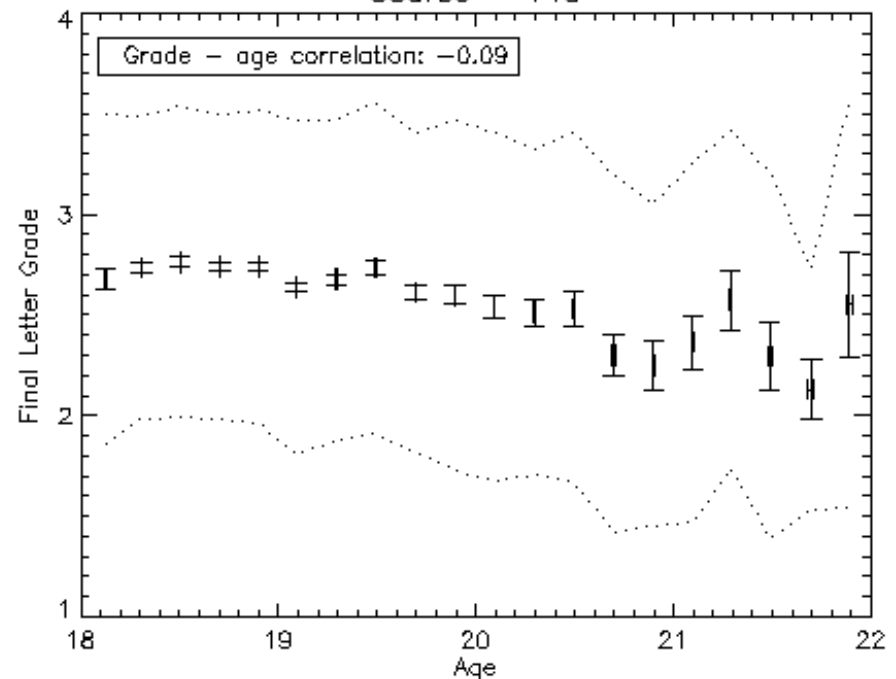
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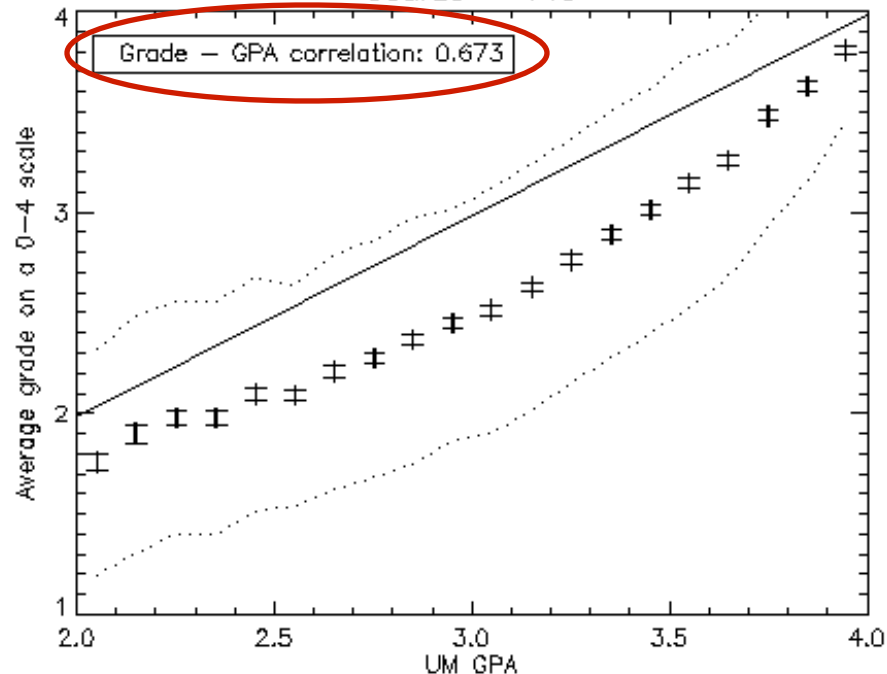
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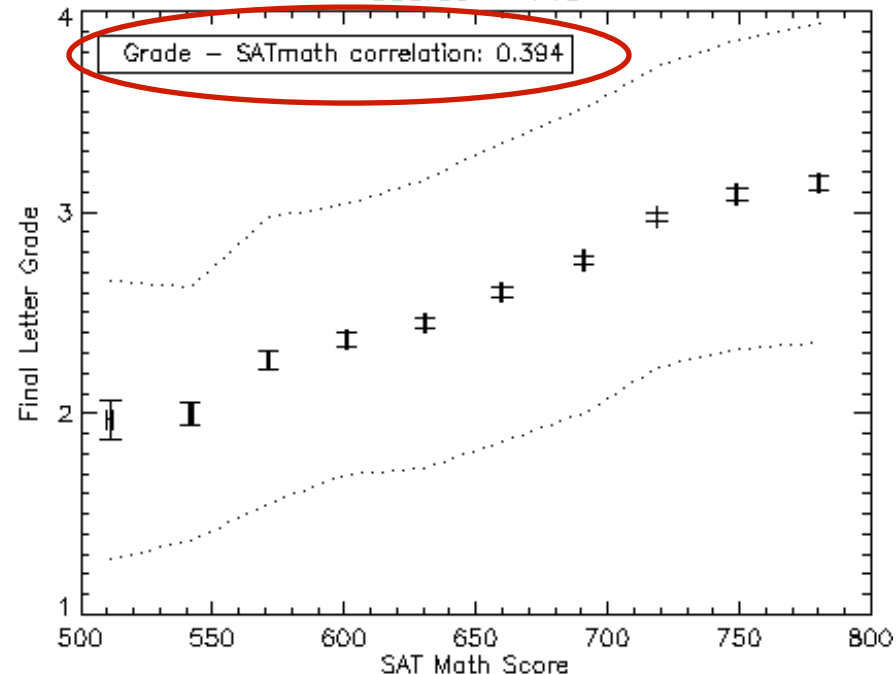
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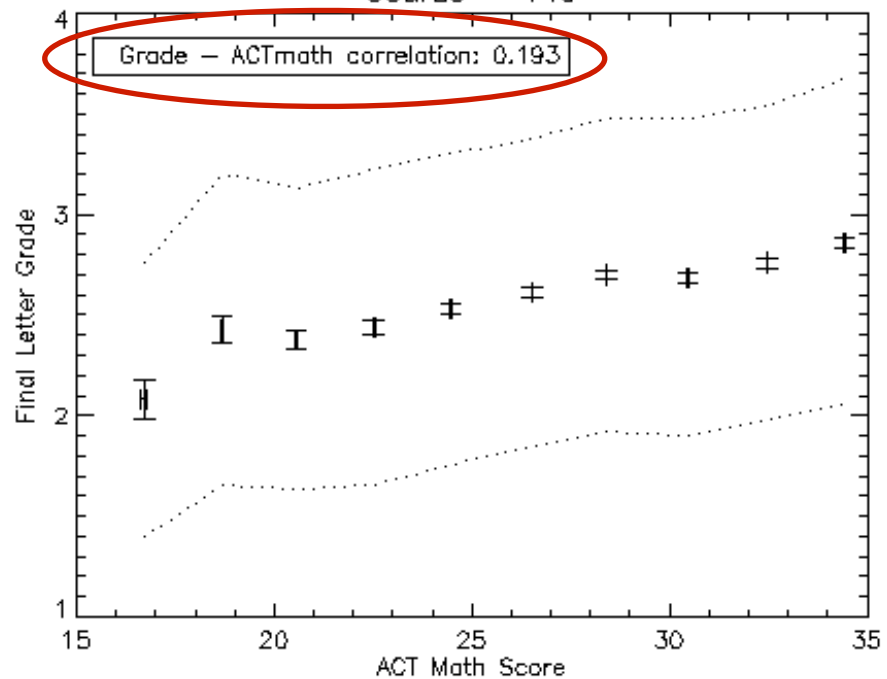
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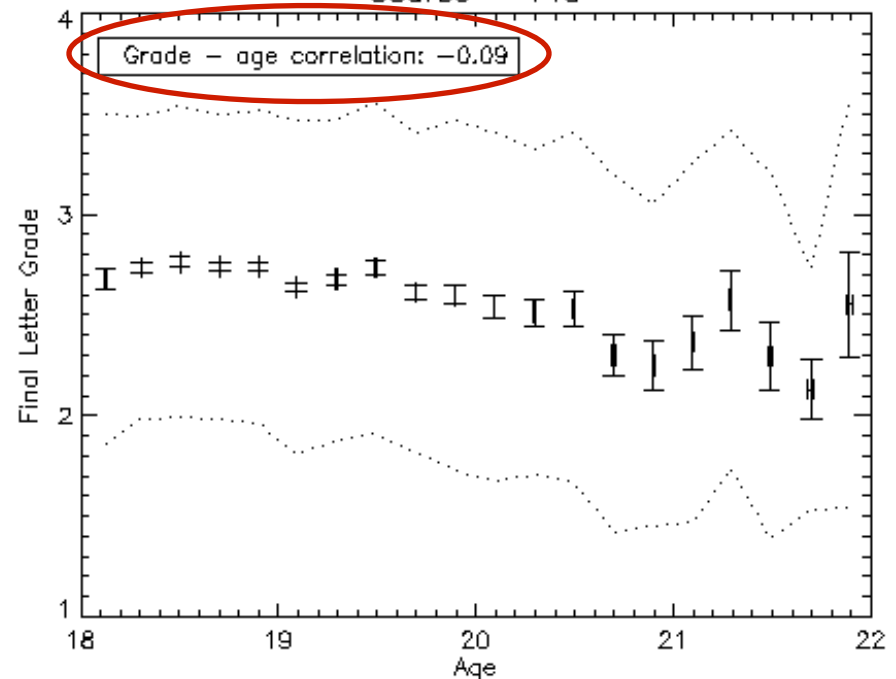
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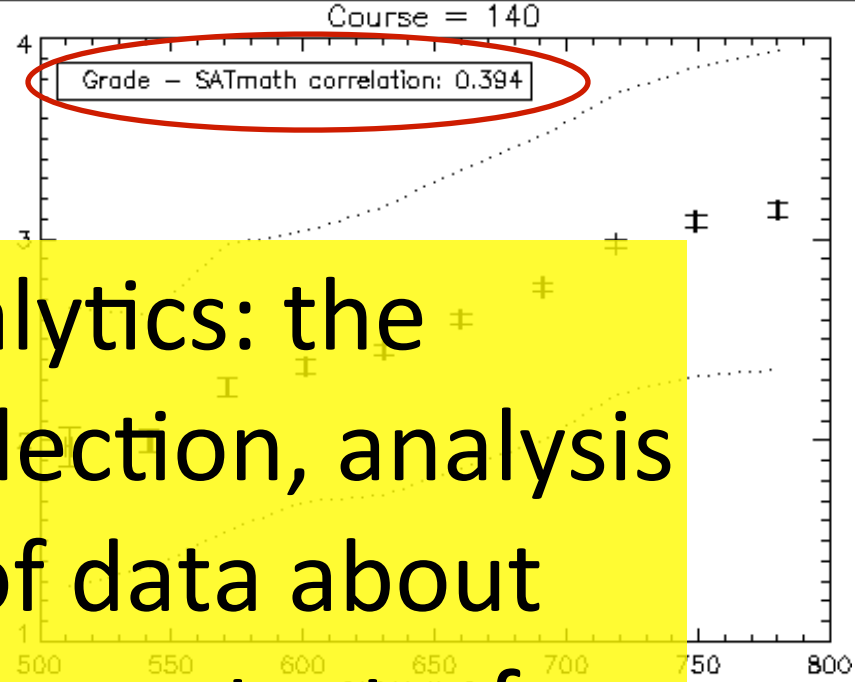
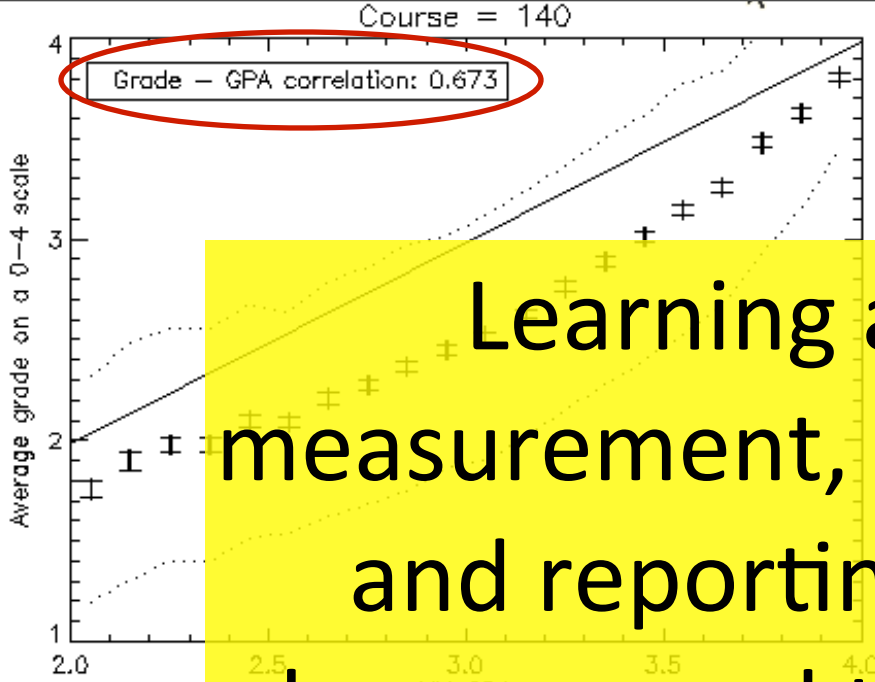


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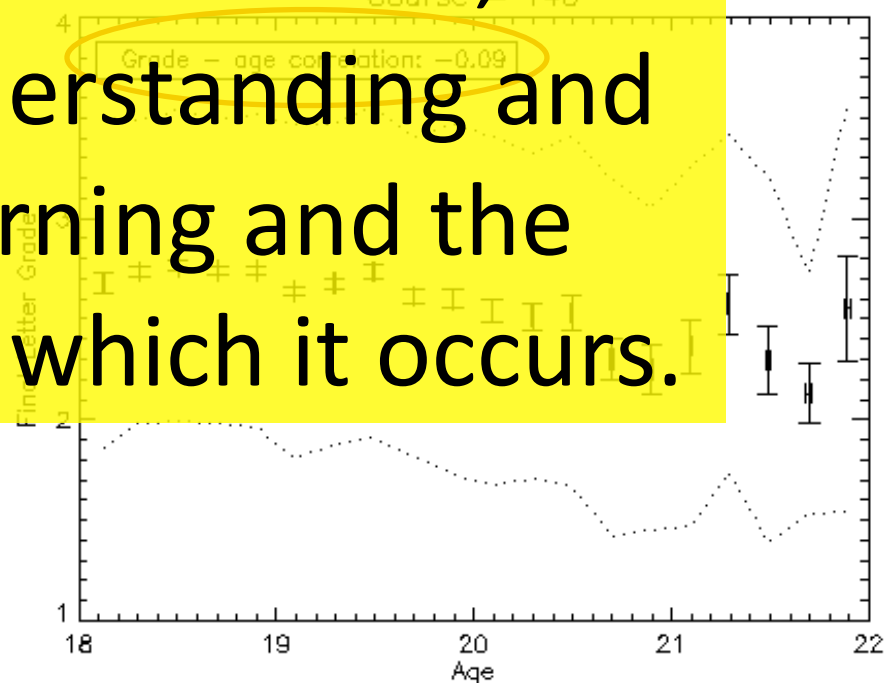
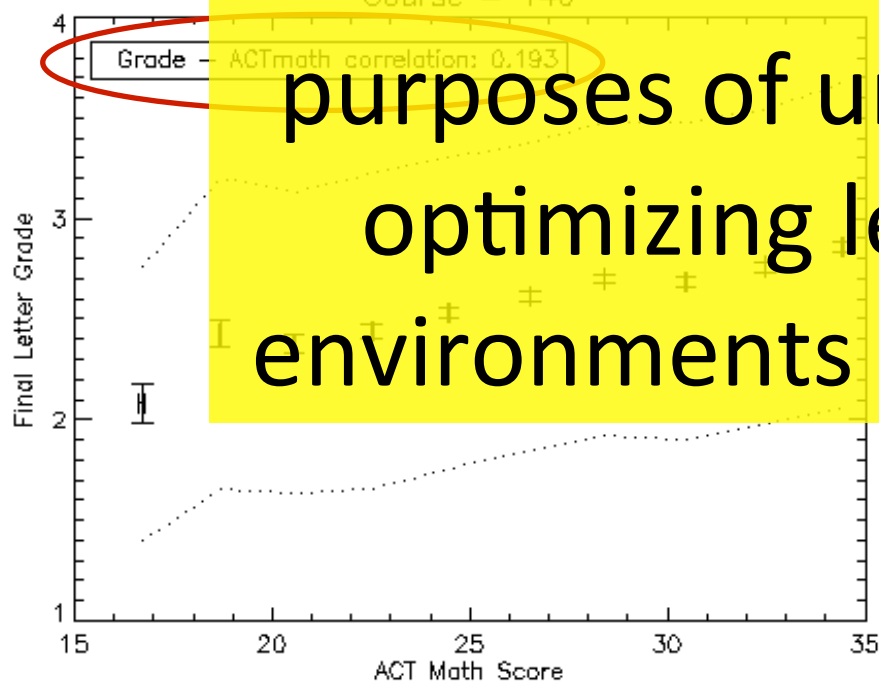


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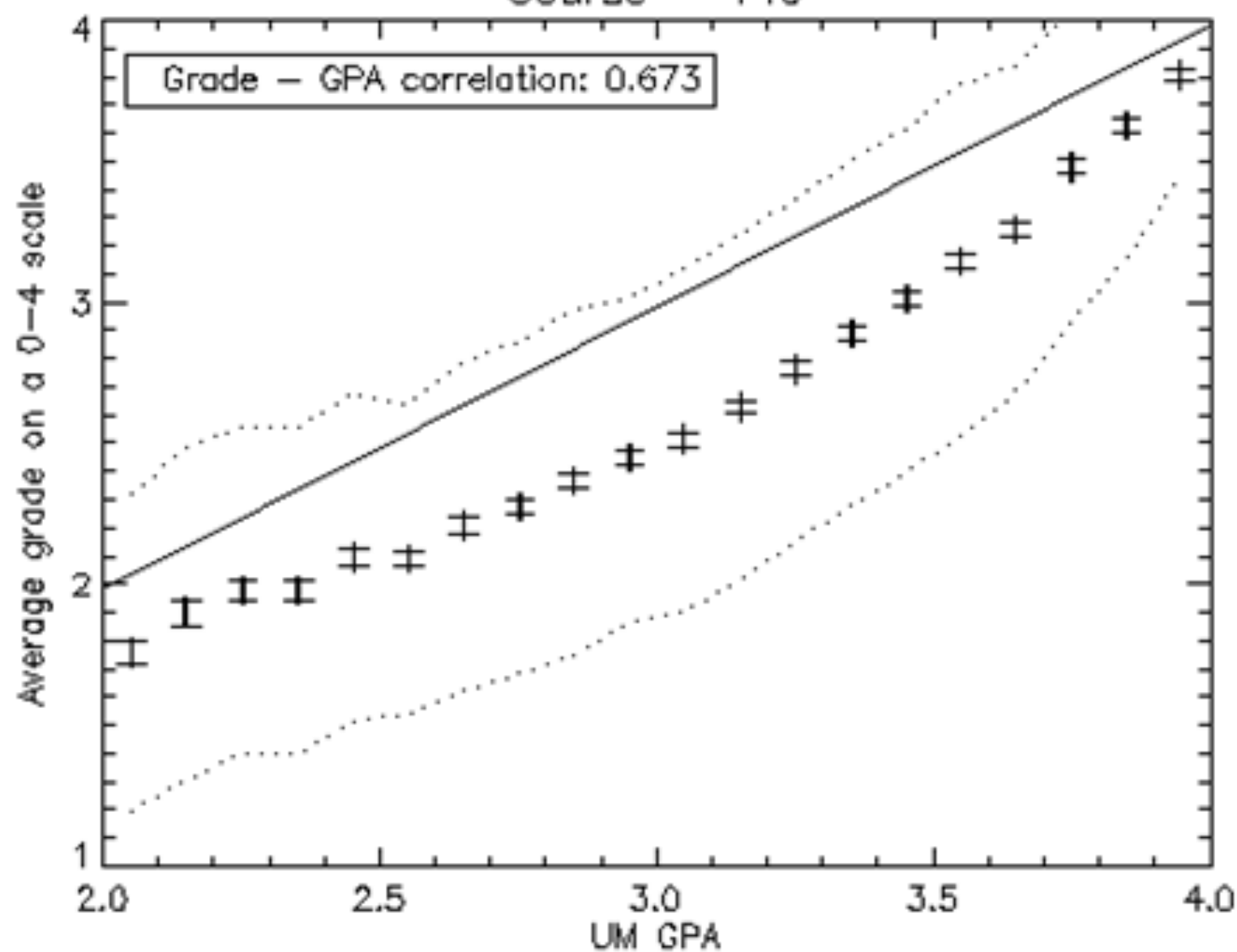




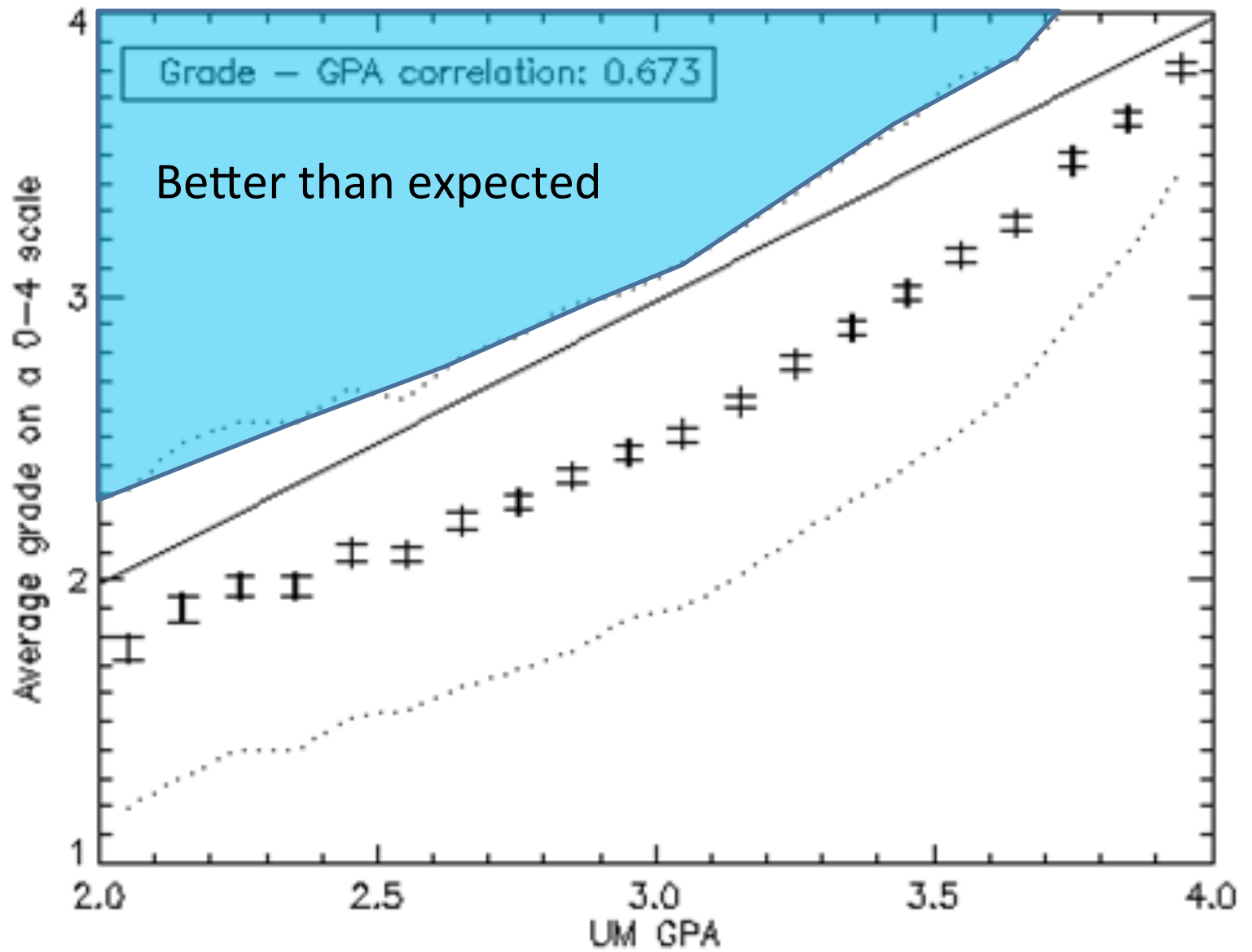
Learning analytics: the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs.



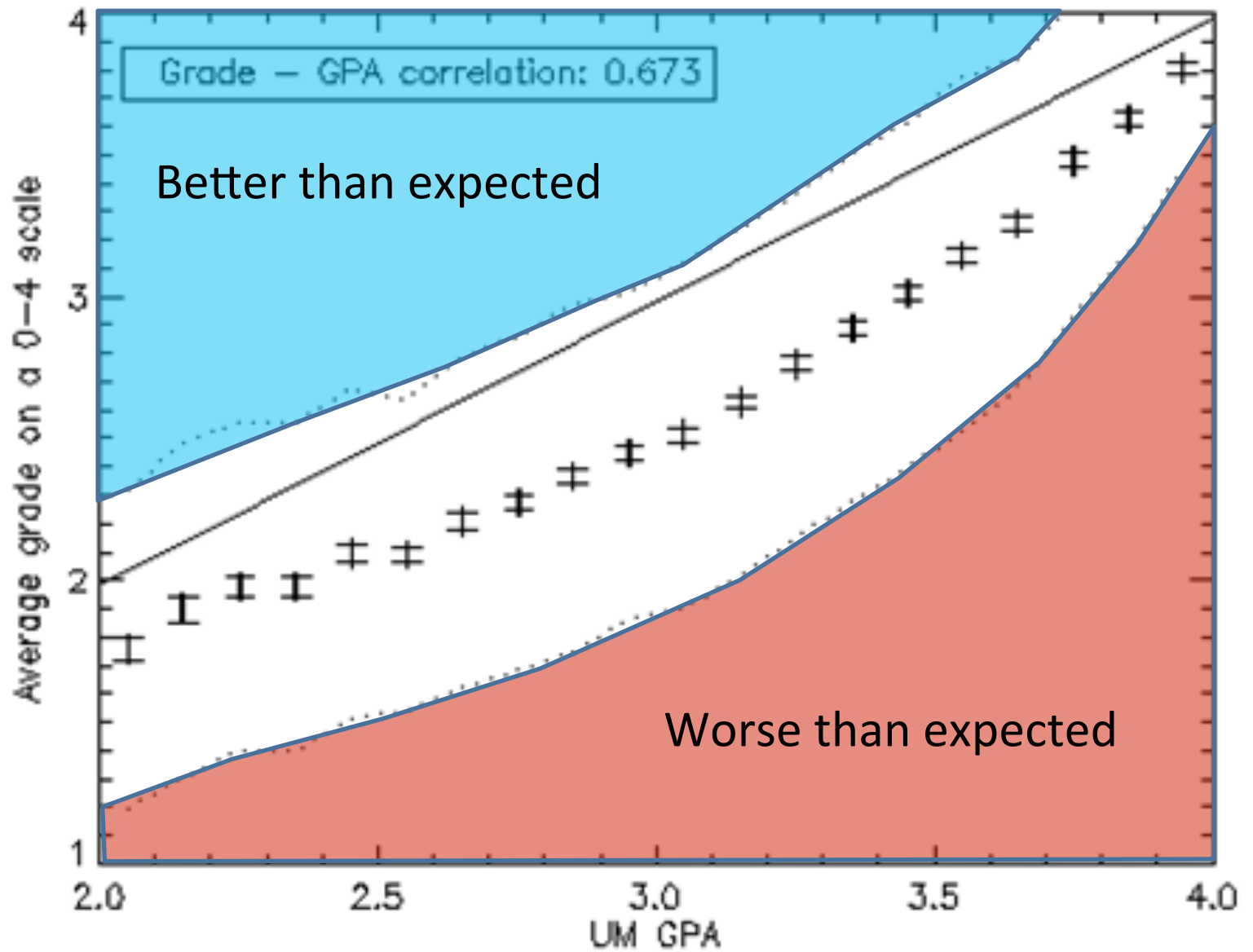
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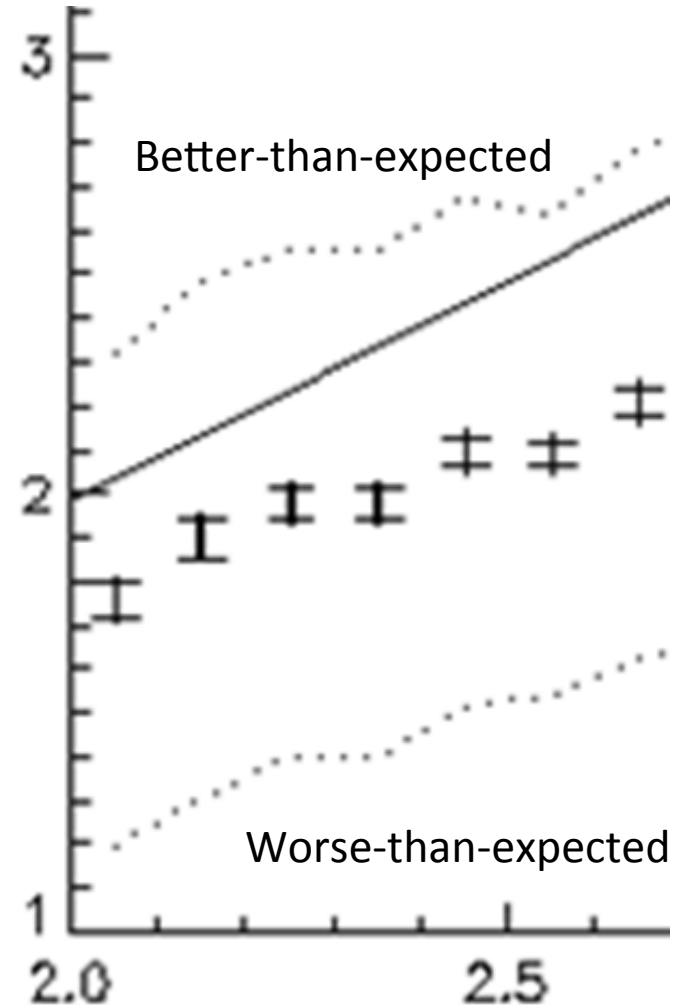


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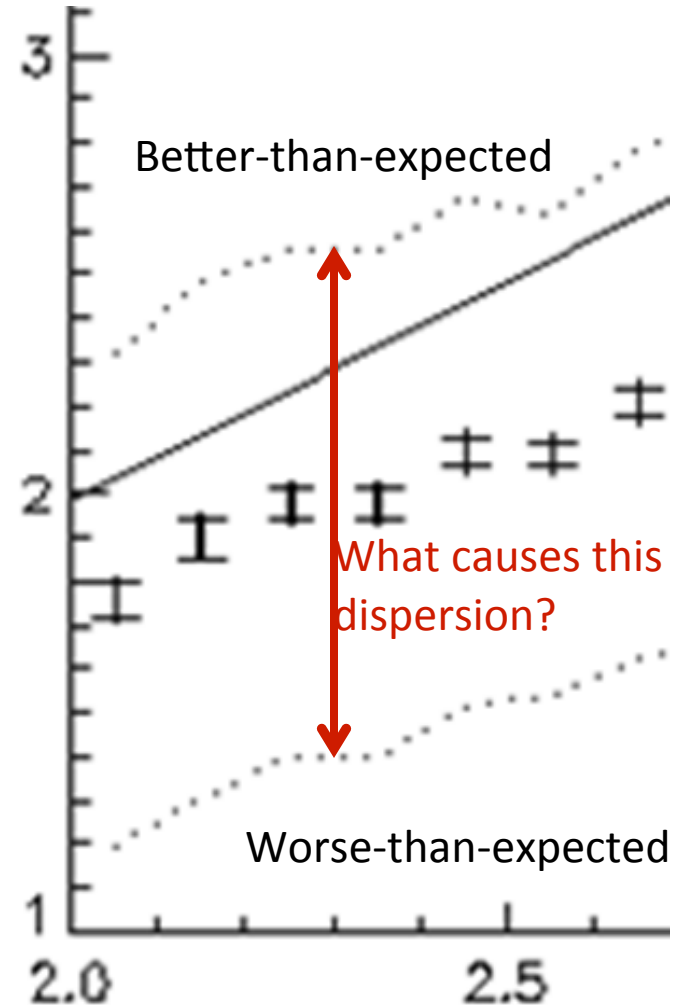
Grade prediction plus

- Two important themes:
 - Exploring dispersion in outcomes at each predicted grade provides insight into existing successful strategies
 - Knowing where students are coming from, where they stand, and where they're headed is **actionable intelligence**



Grade prediction plus

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 - Exploring dispersion in outcomes at each predicted grade provides insight into existing successful strategies
 - Knowing where students are coming from, where they stand, and where they're headed is **actionable intelligence**



Better and Worse-than-expected

- BTE and WTE performance occurs at *all* levels of expected performance
 - A **C** student receiving a **B**
 - An **A** student receiving their first **B+**
- The impact of this *relative performance* on STEM retention is large
- This impact is exacerbated by grade inflation, slower in STEM fields...
- A complex array of factors correlate with BTE/WTE performance
 - Strong support networks *used well*
 - First-generation status
 - Underrepresentation and stereotype threat, especially in gender
 - External overcommitment
- We learn about these from **both quantitative and qualitative data**

Better and Worse-than-expected

- BTE and WTE performance occurs at *all* levels of expected performance
 - A complex array of factors correlate with BTE/WTE performance
- Learning analytics make all of these explorations possible, even the qualitative ones.**
- The impact of this *relative performance* on STEM retention is large
 - This impact is exacerbated by grade inflation, slower in STEM fields...
 - We learn about these from **both quantitative and qualitative data**

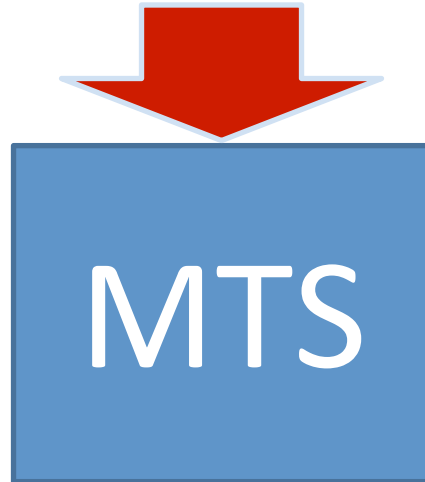
How does E²Coach work?



The Michigan Tailoring System: a mature open-source software system for creating content designed specifically for an individual based on data about that individual

How does E²Coach work?

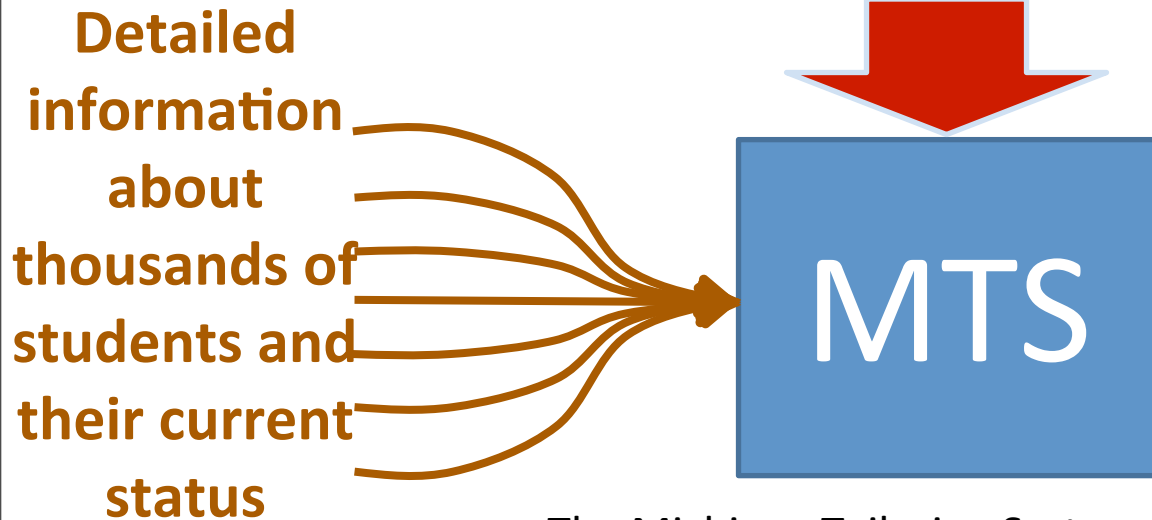
**Expertise of hundreds of
students, dozens of instructors
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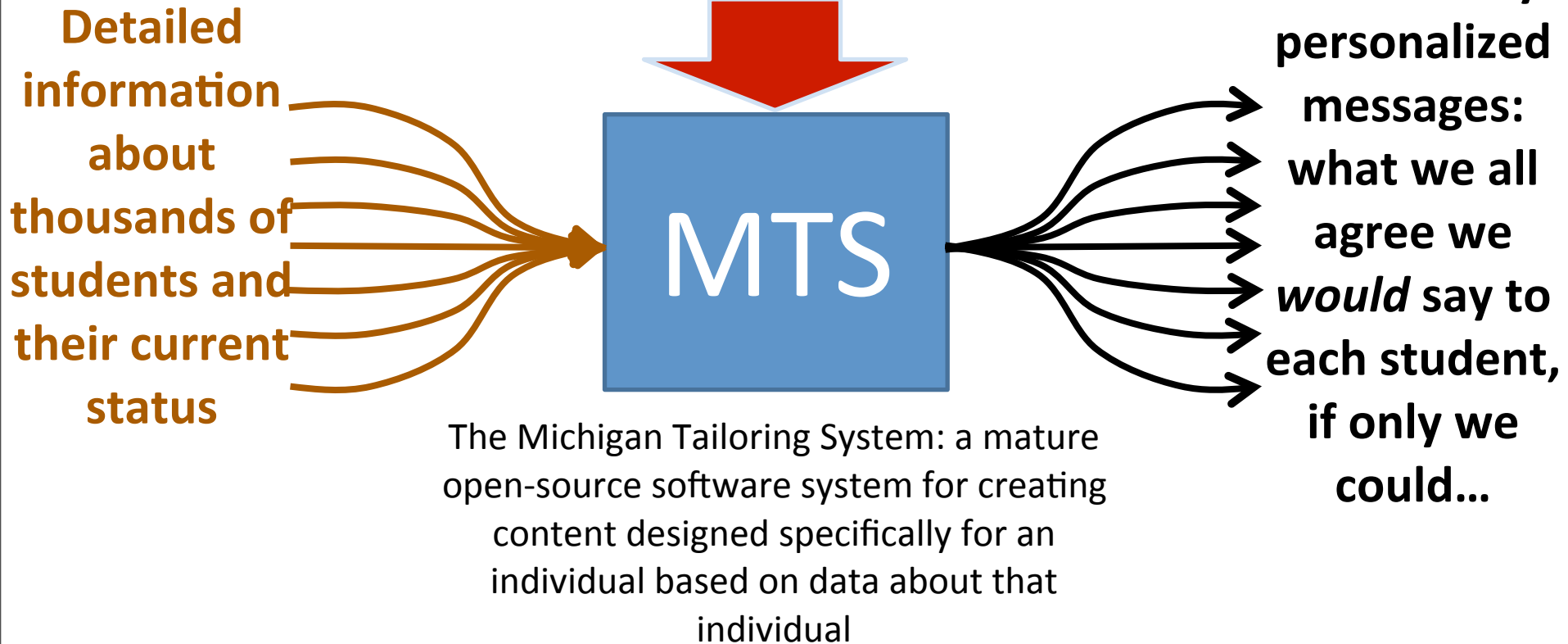
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How does E²Coach work?

Where the
principal effort
lies

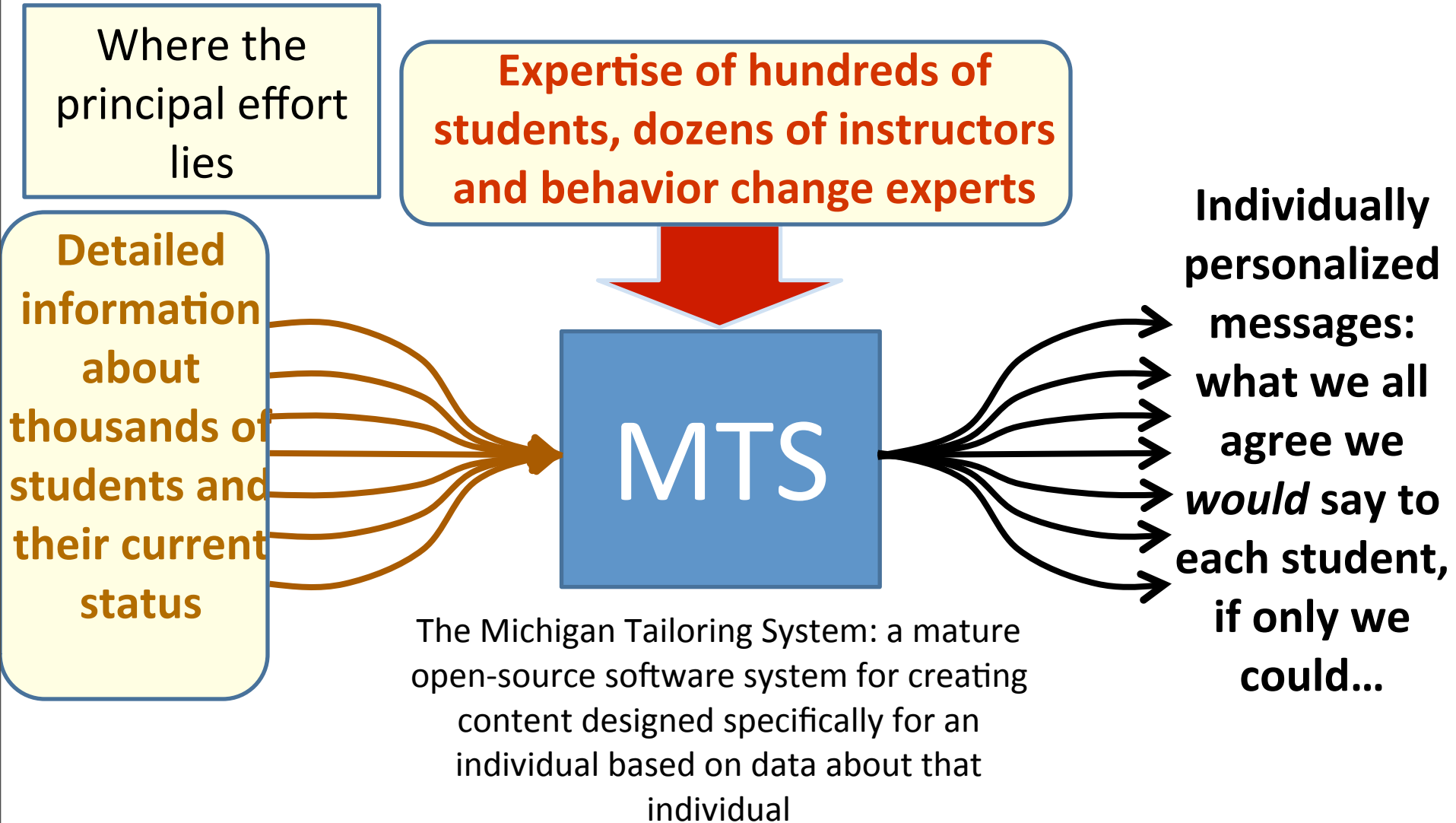
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**Detailed
information
about
thousands of
students and
their current
status**

MTS

The Michigan Tailoring System: a mature open-source software system for creating content designed specifically for an individual based on data about that individual

**Individually
personalized
messages:
what we all
agree we
would say to
each student,
if only we
could...**



What do we tailor on?

- Knowledge of each course and its structure
- Input from the course gradebook
 - Homework scores
 - Classroom response
 - Exams
- **Students opt-in: they choose to participate**
- Input from the student
 - Detailed background in physics, math
 - Goals and interests
 - Co-enrollments
 - Planned effort
 - Desired and expected grades
 - Self-efficacy, confidence, approaches to physics

Which students opted-in?

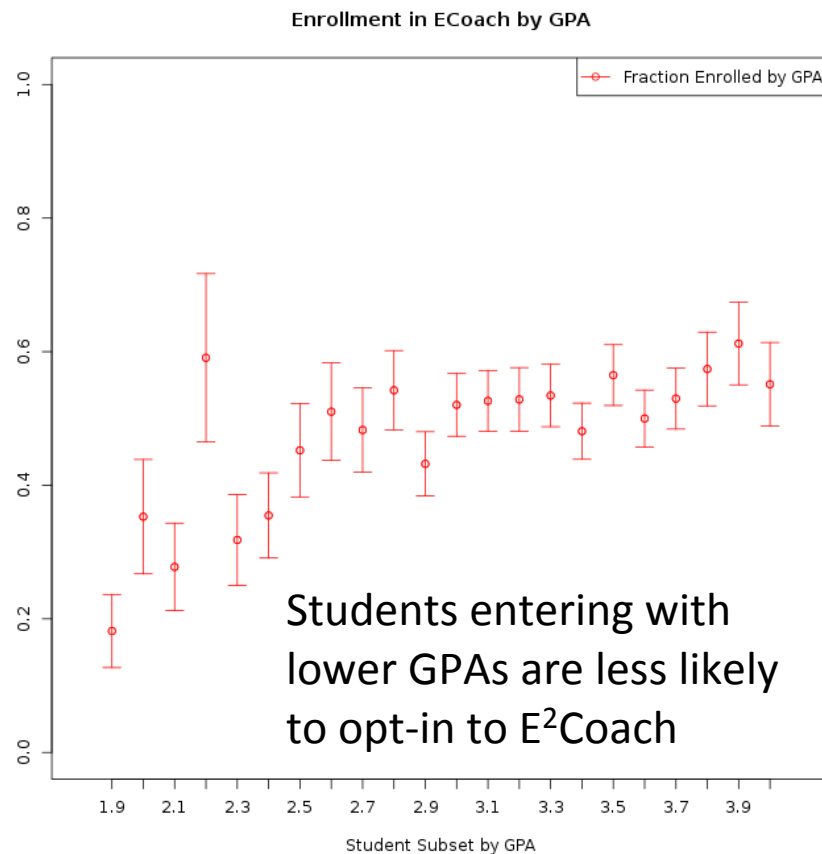
			Physics 140	Physics 240	Physics 135	Physics 235	All Courses
Engineering	Both Genders	Enrolled	292	145	1	0	438
		Total	551	306	2	1	860
		Percent	53.0%	47.4%	N/A	N/A	50.9%
	Male	Enrolled	196	102	1	0	299
		Total	416	245	2	1	664
		Percent	47.1%	41.6%	N/A	N/A	45.0%
	Female	Enrolled	96	43	0	0	139
		Total	135	61	0	0	196
		Percent	71.1%	70.5%	N/A	N/A	70.9%
Non-Engineering	Both Genders	Enrolled	92	43	187	174	496
		Total	181	80	288	403	952
		Percent	50.8%	53.8%	64.9%	43.2%	52.1%
	Male	Enrolled	47	28	81	61	217
		Total	112	59	134	200	505
		Percent	42.0%	47.5%	60.4%	30.5%	43.0%
	Female	Enrolled	45	15	106	113	279
		Total	69	21	154	203	447
		Percent	65.2%	71.4%	68.8%	55.7%	62.4%

1812 students
total, 934 joined

Female students
are substantially
more likely to seek
help from E²Coach
*and other
resources (as
reported in their
surveys...)*

Which students opted-in?

			Physics 140	Physics 240	Physics
Engineering	Both Genders	Enrolled	292	145	1
		Total	551	306	2
		Percent	53.0%	47.4%	N/A
	Male	Enrolled	196	102	1
		Total	416	245	2
		Percent	47.1%	41.6%	N/A
	Female	Enrolled	96	43	0
		Total	135	61	0
		Percent	71.1%	70.5%	N/A
Non-Engineering	Both Genders	Enrolled	92	43	18
		Total	181	80	28
		Percent	50.8%	53.8%	64.9%
	Male	Enrolled	47	28	81
		Total	112	59	13
		Percent	42.0%	47.5%	60.4%
	Female	Enrolled	45	15	10
		Total	69	21	15
		Percent	65.2%	71.4%	68.8%

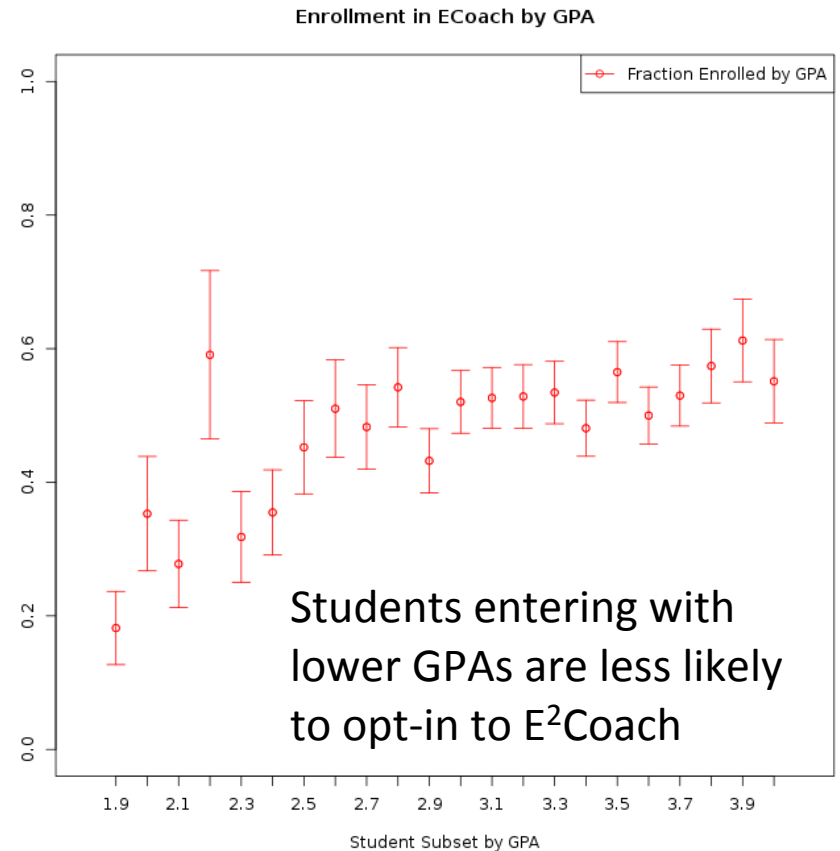


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Engineering	Both Genders	Enrolled	292	145	1	
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	Male	Enrolled	196	102	1	
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		Percent	47.1%	41.6%	N/A	
	Female	Enrolled	96	43	0	
		Total	135	61	0	
		Percent	71.1%	70.5%	N/A	
			Enrolled	92	43	18
			Total	181	80	23
			Percent	44.9%	44.9%	44.9%
			Enrolled	47	28	31
			Total	109	66	109
			Percent	42.0%	47.5%	60.4%
			Enrolled	55	21	15
			Total	69	21	15
			Percent	55.0%	47.5%	68.8%

We contemplate building E²Coach into the structure of these courses, effectively making it required for all students. This will help us to

We contemplate building E²Coach into the structure of these courses, effectively making it required for all students. This will help us to reach all who might benefit from it.



General Information

- Your name is
- Your username is
- You're taking Physics **140**
- You're a **male**
- You're in the **College of Engineering**
- You've completed **1 semester** thus far
- Your cumulative GPA is a **2.9**
- The highest level of education your parents have received is a **4-year College Degree (BA, BS)**
- You **do not** currently work
- The top three things you value are **music, spiritual or religious values and sense of humor**
- You value these things because:
- You're also involved in **religious organizations**

Future Plans

- You are an **Engineering major**
- More specifically, you are a **Mechanical Engineering major**
- You're looking to **get a job** after your graduate

General Information

- Your name is
- Your username is
- You're taking Physics **140**
- You're a **male**

Science and Math Background

- The highest level of physics you took in high school is **non-AP Physics**
- The highest level of math you took in high school is **AP calc AB**
- You **did not** take the SAT
- Your ACT math score is **30**
- Thus far in your college career, your math experience includes: **taking Math 115**
- Thus far in your college career, your chemistry experience includes: **receiving AP Credit or testing out of Intro Chemistry**
- You **have not** taken a biology class thus far in college

This Semester

- You are currently enrolled in: **Math 116 and Engineering 100**
- You are taking this course because **it is required by your concentration**
- You want to receive **an A** in this class and are **not confident** you can achieve this
- You expect to receive **a B-** in this class
- You plan on spending **4** studying outside of class, **3 hours** preparing for exams, and **2 hours per week** doing your Mastering Physics
- You actually spent **-1** studying for the first exam
- You plan on **going to helproom less than 3 times a semester**
- You plan on **going to office hours once every two weeks**
- You **are unsure** what **CSP** is

General Information

- Your name is
- Your username is
- You're taking Physics **140**
- You're a **male**

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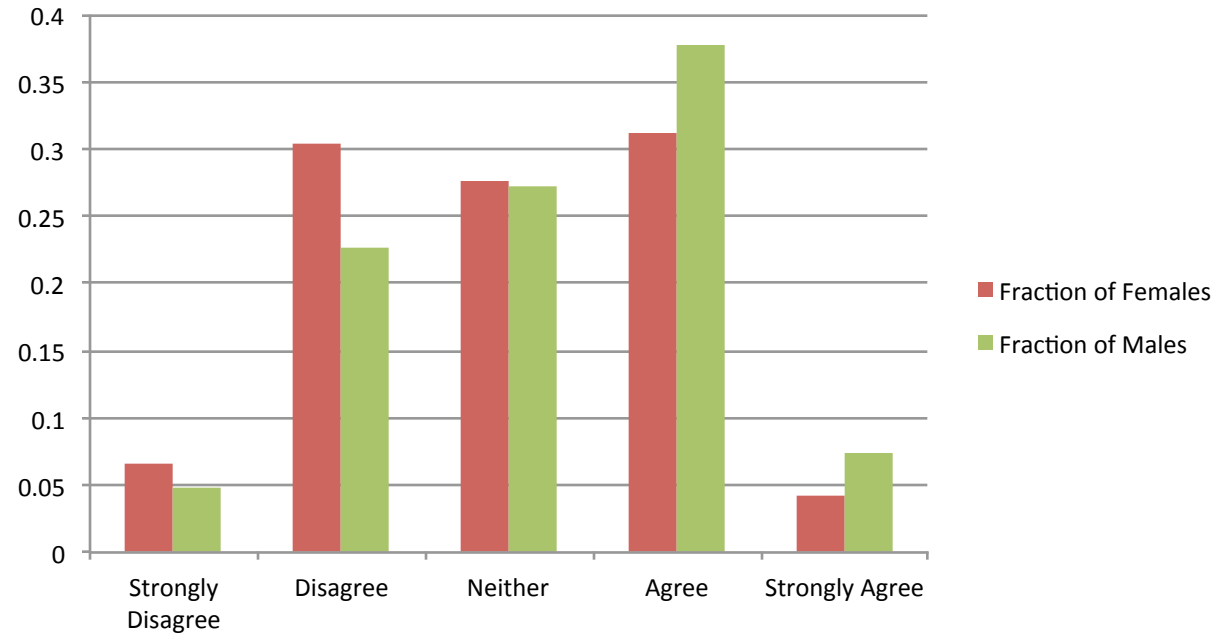
- You are currently enrolled in: **Math 116 and Engineering 100**

Attitudes

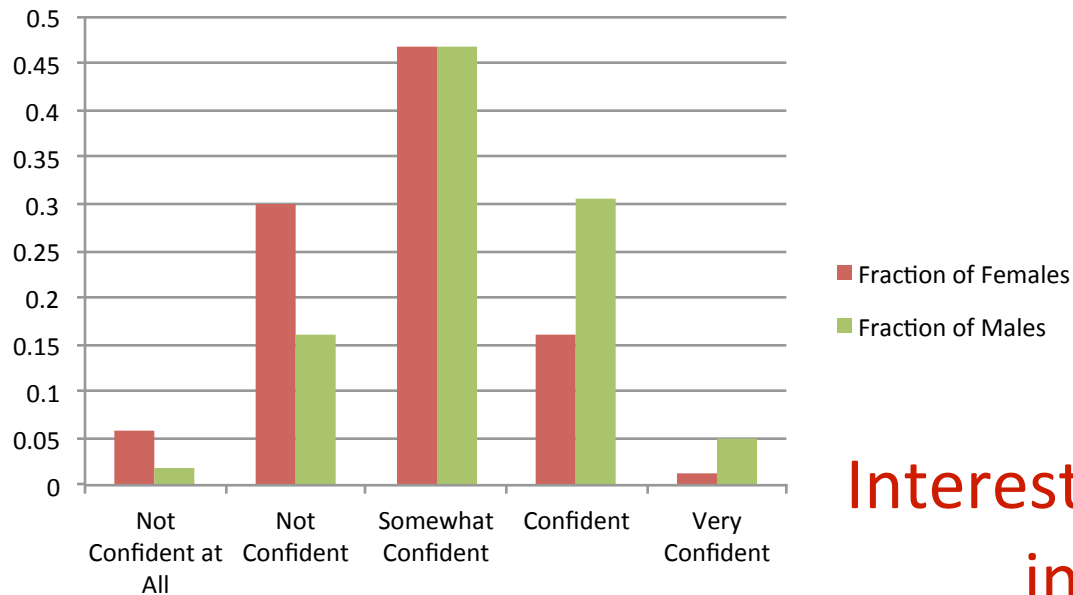
- You **agree** with the statement "A significant problem in learning physics is being able to memorize all the information I need to know."
- You **disagree** with the statement "Basic math skills (solving equations, trigonometry, basic calculus) will pose a challenge to me in this course."
- You **agree** with the statement "In doing a physics problem, if my calculation gives a result very different from what I'd expect, I'd trust the calculation rather than going back through the problem."
- You **neither agree nor disagree** with the statement "If I can't solve a physics problem, it is usually because I didn't work on it hard enough."
- You **strongly agree** with the statement "Nearly everyone is capable of understanding physics if they work at it."
- You **disagree** with the statement "Understanding physics basically means being able to recall something you've read or been shown."
- You **disagree** with the statement "Spending a lot of time understanding where formulas come from is a waste of time."
- You **strongly agree** with the statement "A significant challenge in learning physics is being able to apply a few fundamental principles in many circumstances."
- You **neither agree nor disagree** with the statement "If I don't understand a scientific concept, it is usually because I didn't work on it hard enough."

Agency: If I don't understand a scientific concept, it is usually because I didn't work on it hard enough.

Agency: hard work is enough



Confidence



Confidence: How confident are you that you can receive your desired grade?

Interesting gender differences
in affect questions

Design and delivery of messages

- Course-specific technical advice
- Normative information
- Goal derived motivators
- Testimonials specific to the moment
- Data graphics predicting outcomes and tracking improvement
- Each student receives a personalized web page
 - Home
 - Advice
 - Profile
 - Status
- Updated when significant new information arrives (e.g. after exams)

E²Coach in the Michigan Tailoring System Workbench

MTS Workbench - Nightly 3.0.4391 - 07/14/2011 11:16

File Edit Search Window Help MTS Message Editor

Team Synchronizing SVN Repository Exploring Authoring Perspective

Project Explorer

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 - Exam_1_Prep_Advice 362
 - Exam_1_Prep_Home 280
 - Exam_1_Prep_Profile 436
 - Exam_1_Prep_Survey 285
 - Exam_1_Response 436
 - Exam_1_Response_Advice
 - Exam_1_Response_Home
 - Exam_1_Response_Profile
 - Exam_1_Response_Survey
 - Exam_2_Response 436
 - General 353
 - Debug_Message_2 384
 - Debug_Message 291
 - Welcome_Message 443
 - Publisher 36
 - Surveys 84
 - Test Cases 433
 - Utilities 397
 - ECoach v. 0.2 432
 - ECoach v 0.1 33 [https://yertle.chcr.i

Exam_1_Prep_Advice.messages Exam_1_Response_Advice.messages

Expand All Collapse All Cut Copy Paste Delete

Add section Add text Add paragraph Add heading Add graphic Add comment Add block Add select Add list Add listitem Search Goto ID

Outdent Row Indent Row Print Export

section: 'Main_Text' (2) > block: 'Students_Just_Like_You' (5) > text (6) Logic Errors in Document

	Command	Options	Logic	Message	Notes
12	block	tag: td class: icontent			
13	text			Like you, \$Testimonial_Name_2	
14	text		(Course==135 or Course==235) and Post_College=="Med_School"	is going to be a doctor.	
15	text		(Course==135 or Course==235) and not Post_College=="Med_School"	didn't take physics because \$She_He has to prepare for the MCAT.	
16	text		(Course==140 or Course==240) and intersection(Concentrate, ["Engineering"])	is an engineering student.	

Message Editor XML View

What we provide

- Tailored advice on all aspects of the course, including testimonials from relevant peers

General Advice

[Your Peers:](#) Your fellow students provide some of the best advice. Click here to see what they had to say.

[Practice:](#) Doing well in physics requires practice, just like learning a sport. Find out how to practice effectively.

[A New Way of Thinking:](#) Physics is different from other science classes. Here are some new approaches you should take.

[Believe in Yourself:](#) Learning physics takes effort, but everyone can do it! Here are some tips.

[Time Matters:](#) It's not just how to study, but we can offer basic ideas about how long to study.

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General Advice

Tools

[Your F](#)

[Practic](#)

[A New
shoul](#)

[Believ](#)

[Time M](#)

[Lecture:](#) Lecture is your instructor's chance to guide your study of the material. Find out the top 5 ways to make the most of lecture.

[Discussion:](#) Lecture lays the material out - discussion is your chance to really practice. Here are 6 ways to make the most of this opportunity.

[Mastering Physics:](#) Online homework gives you the chance to work on your homework until you get it right. Students do their homework well get better exam scores! Find out the 5 things you should keep in mind when doing your Mastering Physics.

[Additional Resources:](#) There is a nearly limitless array of online resources beyond your official course materials that may help you to learn. Here are a few favorites.

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[Students Just Like You:](#) Find out study techniques that previous students recommend just for you!

Based on interviews with past physics students, we've collected some advice that will help you prepare for your first exam.

S Like you, Katelyn is an engineering student. she got a great grade in her physics of life course.

Katelyn says,



"To study for the first exam, my best advice is to start early. You need to put in the time to understand all the concepts and get to know question formats. Instead of just skimming your notes and book, take a hard look at them – and maybe even recopy sections of your notes, before making your notecard. The more times you see information, the more it will stay in your memory. Do as many of the practice exams as you can, without looking at the answers (and before any review sessions, preferably). Another study tip is to work with a partner and take turns explaining concepts to each other. Having to teach someone else will make sure you're not missing any crucial points. And if you've still got questions, you'll have time to go to office hours or study sessions to ask questions."

Here's what some other techniques students recommend when studying for the first exam:

S "I used to go to the library for a large chunk of time and work through problems and then look at solutions if I wasn't sure. I made sure I UNDERSTOOD not memorized every step."

S "One really good strategy is to first go through your notes and put all of the equations you covered in one spot. Then go through old mastering physics problems (you can use the practice function to get new numbers). When you feel secure in your understanding take a look at the practice exams. It's best if you take the exam as if it were your actual test. Try not to give up on a problem and look at the answer, it's really hard to assess whether you actually understand the problem when the answer is right in front of you."

S "Definitely going through the practice exams and knowing how to do the problems. I guess it was more learning how to approach problems that definitely helped. Seeing examples we talked about in class and going through them by yourself was useful."

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[Your F](#)

[Practi](#)

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Next Steps: Preparing for Exam 2

[It's Only a Matter of Time Until Exam 2!](#) Find out how to plan your time accordingly

You told us that you spent 2 hours studying for exams. However, you didn't get the grade you wanted with this amount of studying. It looks like for exam 2, more hours studying are necessary to bring up that grade. Most professors recommend you study 6-10 hours.

Don't do it all at once—break up these hours and do a little studying each day. Start studying about a week before the exam and do a little every day.

In many cases, exams are scheduled around the same time. You told us that you are co-enrolled in Math 215. Do they have exams the same week as physics? If so, you should start planing your study time so you are able to dedicate enough time to all of your exams.

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right
ach

E²Coach Status and Future

- E²Coach for physics launched in January 2012: four courses, 1835 students total, 953 enrolled
- In Fall 2012 we will make it a required element of these courses
- Examples of E2Coach content being delivered now are provided...
- Ultimate goal: a tailored communication interface between each student and the University – *in both courses and academic advising*

[Lecture: Lecture is your instructor's chance to](#)

[Students Just Like You: Find out study techniques that previous students recommend just for you!](#)

Next Steps: Preparing for Exam 2

[Discussion: I](#)

How Things are Going

[Don't "Choke": Learn about recent research that will help you to perform to your fullest potential in a pressure situation.](#)

When you sit down in the Dennison lecture hall ready to take an exam, are you nervous? When the test begins are you able to start the problems right away or do you find yourself choking under the pressure?

R

The popular book *Choke: what the secrets of the brain reveal about getting it right when you have to* by Sian Beilock explores the of it like this: when it comes to an exam, it's only natural to be a little nervous. However, you can handle this anxiety in one of two go or you can choke. If you cave under the pressure, you lose some of your brain power to stress and self-doubt; you literally do problems in front of you and your working memory capacity is limited. This leads to poor performance.

Luckily, Beilock has several sug improve your working memory c:

- **Reaffirm your self-wor** Reaffirming yourself, espe
- **Map out your complexi** highlight that this one test
- **Write about your worrie** in high-pressure situation
- **Meditate away the worr** your cognitive horsepower
- **Think differently.** Think stereotyped to be bad at i Focus on your credentials
- **Reinterpret your reacti** circumstances, such as w rather than negative ("I ar
- **Pause your choke.** Walk helps you to let go of your focus on irrelevant problem details and instead think in a new way or from an alternative perspective lead to a breakthrough and success.
- **Educate the worries.** Merely drawing attention to the stereotypes you may hold - for instant, "Girls can't do math" or "Whites a yourself the stereotypes diagnostic

E²Coach: Expert Electronic Coaching

University of Michigan

Hello John!

Welcome to your ECoach site. We'll be here every

It's especially important for you to do well becau physics right when you design a steering mecha

You can turn to us for advice about using your s

You told us that the grade you want to receive is sure that you can do well. ECoach will be here e

Where Does Physics Fit?

You told us that you value independence, learni work associated with your other classes. There

We see that you have many strengths coming in

- You've already learned some Mechanics
- You're confident in your math skills
- Physics is applicable to your everyday life

There are also some factors that could be poten

- Physics is a difficult subject for anyone to
- You said that you're not taking this course
- Physics requires a different way of thinking

[Students Just Like You: Find out what your peers tell you about the first exam!](#)

We've interviewed several past physics students to see what advice they'd give to someone like you after the first exam. Here's what they had to say:

S Blythe took physics of life and earned an exceptional grade. Like you, she didn't take physics because she had to prepare for the MCAT.

Blythe says,



"Don't Lose hope! Go over what you got wrong and talk to someone about how you should have done/approached those problems. Switch up studying techniques if you think that will help. As you learn the new material, you now have a sense of how it might be turned into an exam question – so keep those thoughts in the back of your head as you go along."

Other students would tell you,

"Make sure to know what the important concepts are before focusing on specific details. If something wasn't covered in class or mentioned at all, chances are that it is less important and doesn't need to be the prime focus of your studying. Make sure to go to the exam review session (if there is one), office hours before the exam, as well as the class period before the exam. A general outline of the exam is usually provided during one/all of these times and can help you know exactly what to focus on during your study time. Another potential issue is study habits. There are many resources to help change your study habits for the better. Everyone learns differently, but a quiet environment with no distractions is generally a good way to study initially. I do recommend, once you have grasped the concepts on your own, to get together with your peers and discuss the concepts/do practice problems together. I have learned so much through my peers—I believe they are one of the most underrated resources."

S "I would evaluate what you are already doing. Then throw out what is wasting time and look for new methods. See what other students are doing, what the professor says and ask people in the help room."

abisht Physics 235: Predicted grade D

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Welcome

Hello again T

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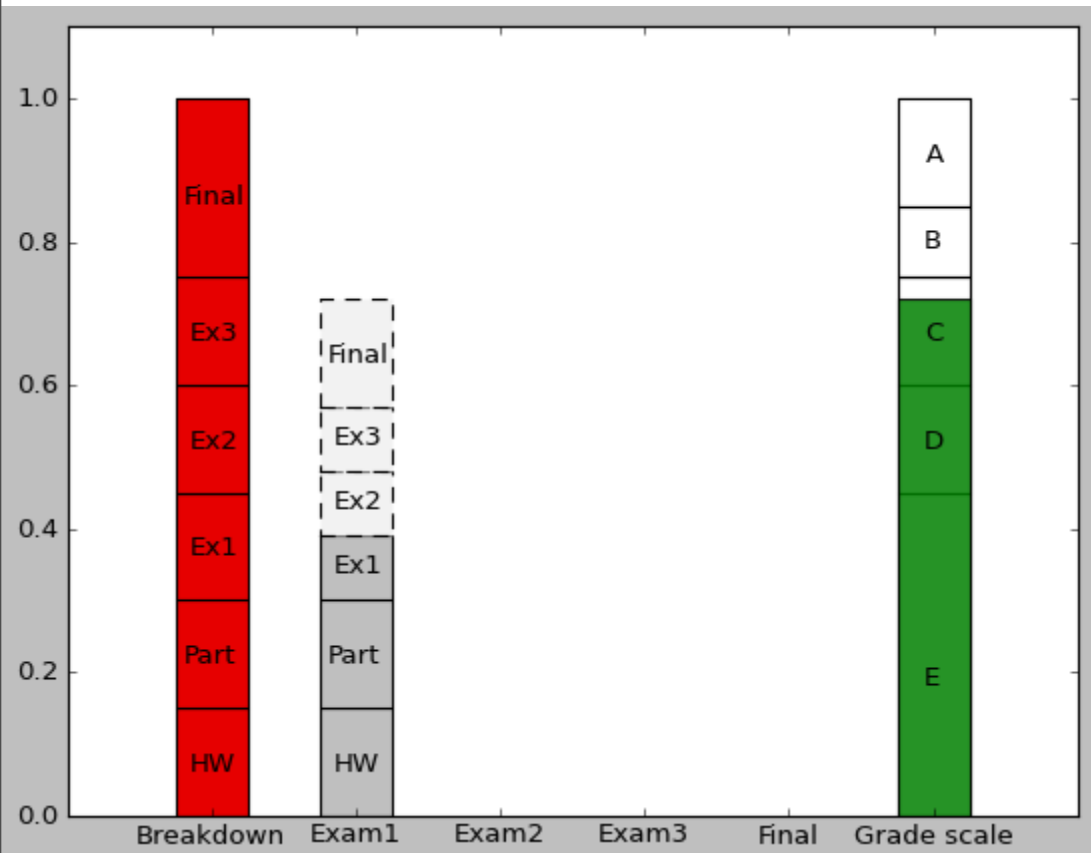
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Breakdown Exam1 Exam2 Exam3

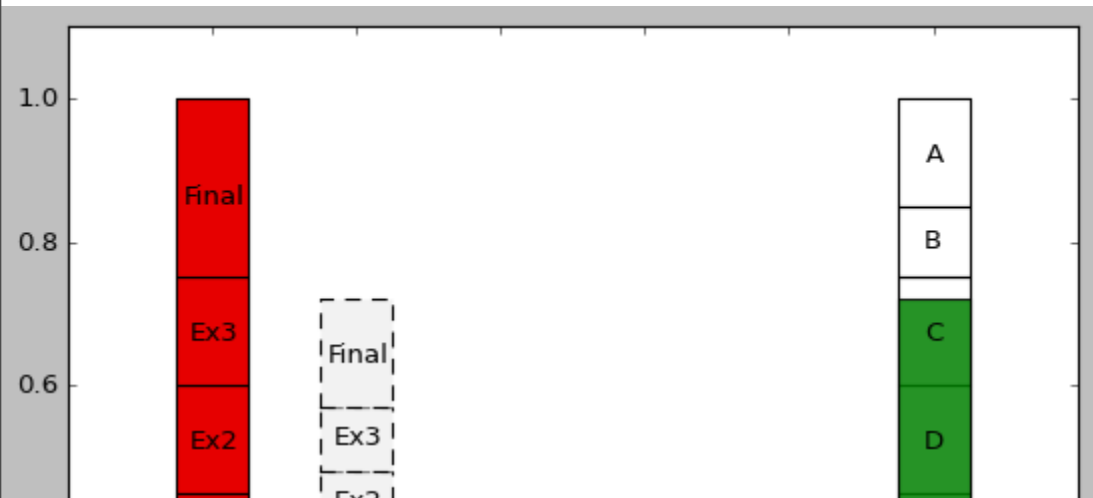
What we provide

- Personalized feedback on status and prospects



What we provide

- Personalized feedback on status and prospects



Next Steps: Preparing for Exam 2

[It's Only a Matter of Time Until Exam 2! Find out how to plan your time accordingly](#)

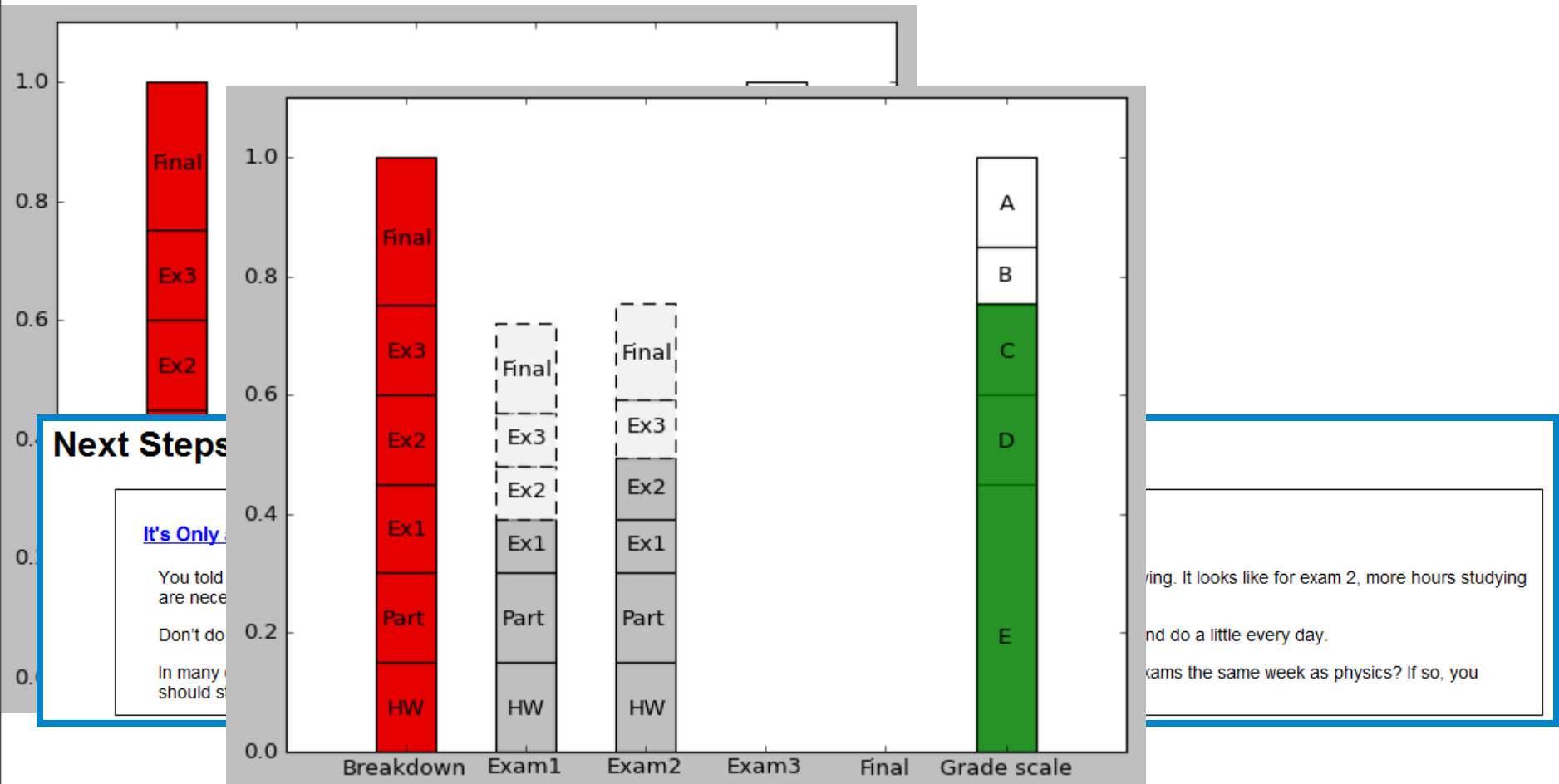
You told us that you spent 2 hours studying for exams. However, you didn't get the grade you wanted with this amount of studying. It looks like for exam 2, more hours studying are necessary to bring up that grade. Most professors recommend you study 6-10 hours.

Don't do it all at once—break up these hours and do a little studying each day. Start studying about a week before the exam and do a little every day.

In many cases, exams are scheduled around the same time. You told us that you are co-enrolled in Math 215. Do they have exams the same week as physics? If so, you should start planning your study time so you are able to dedicate enough time to all of your exams.

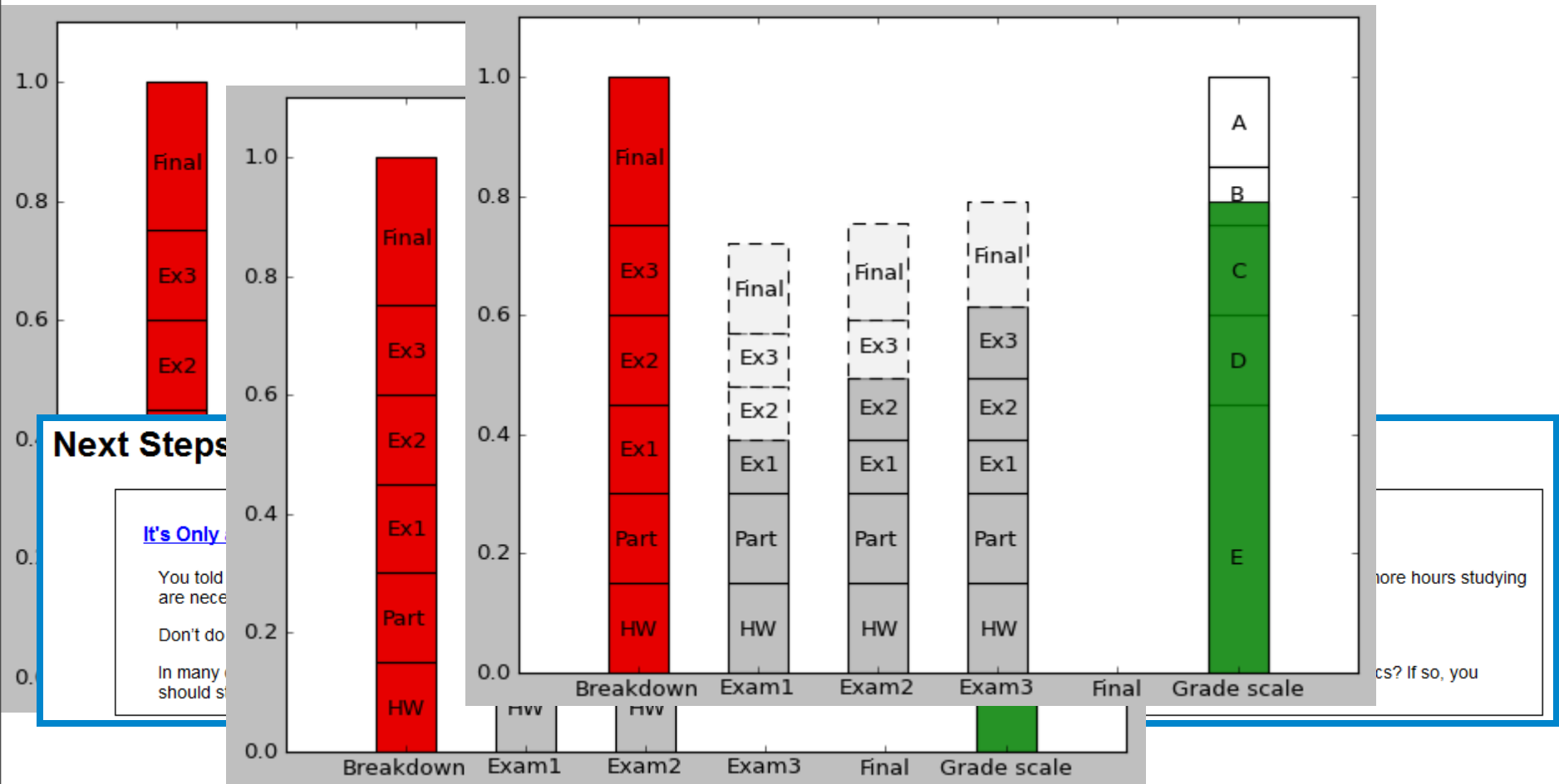
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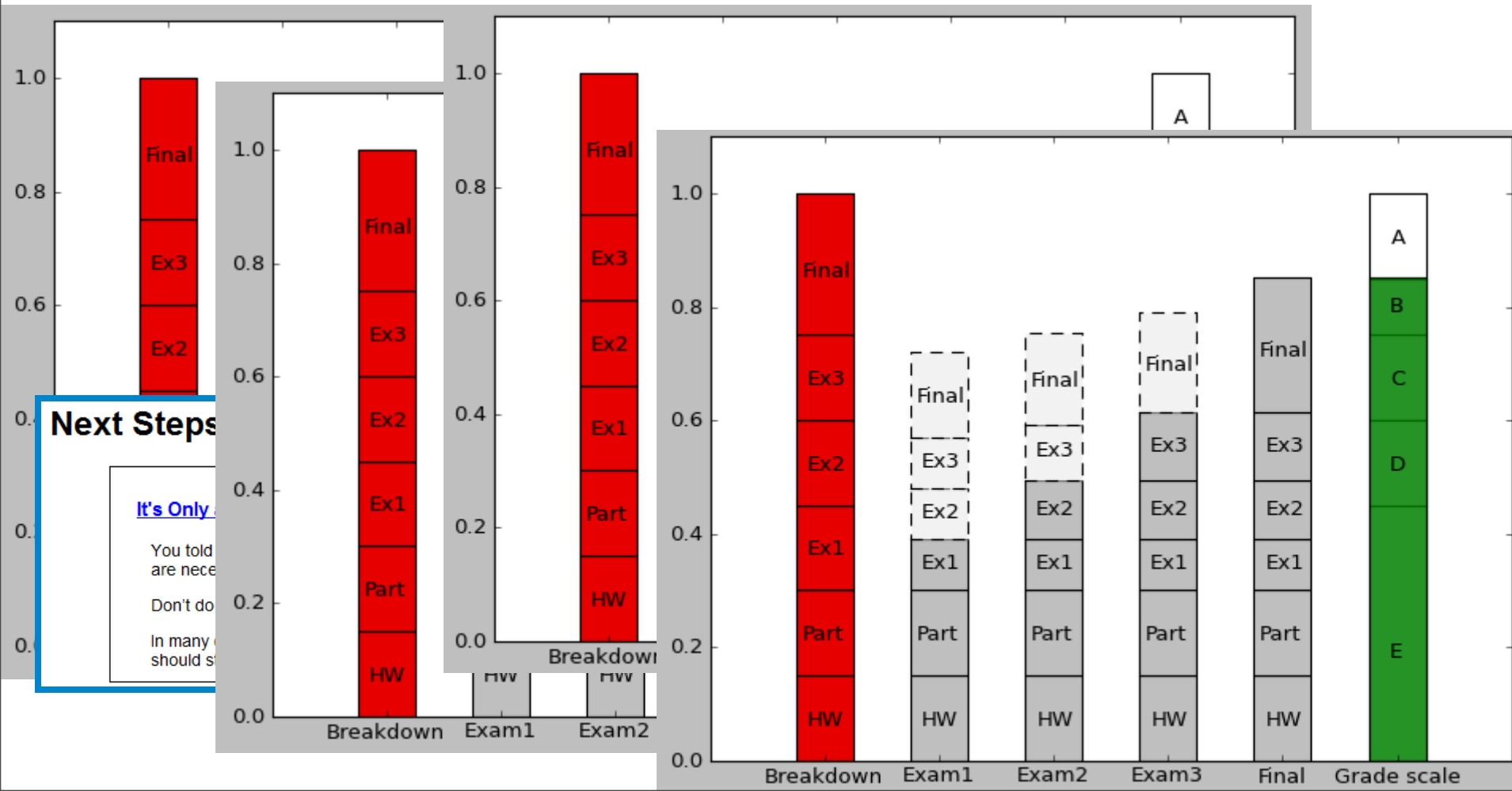
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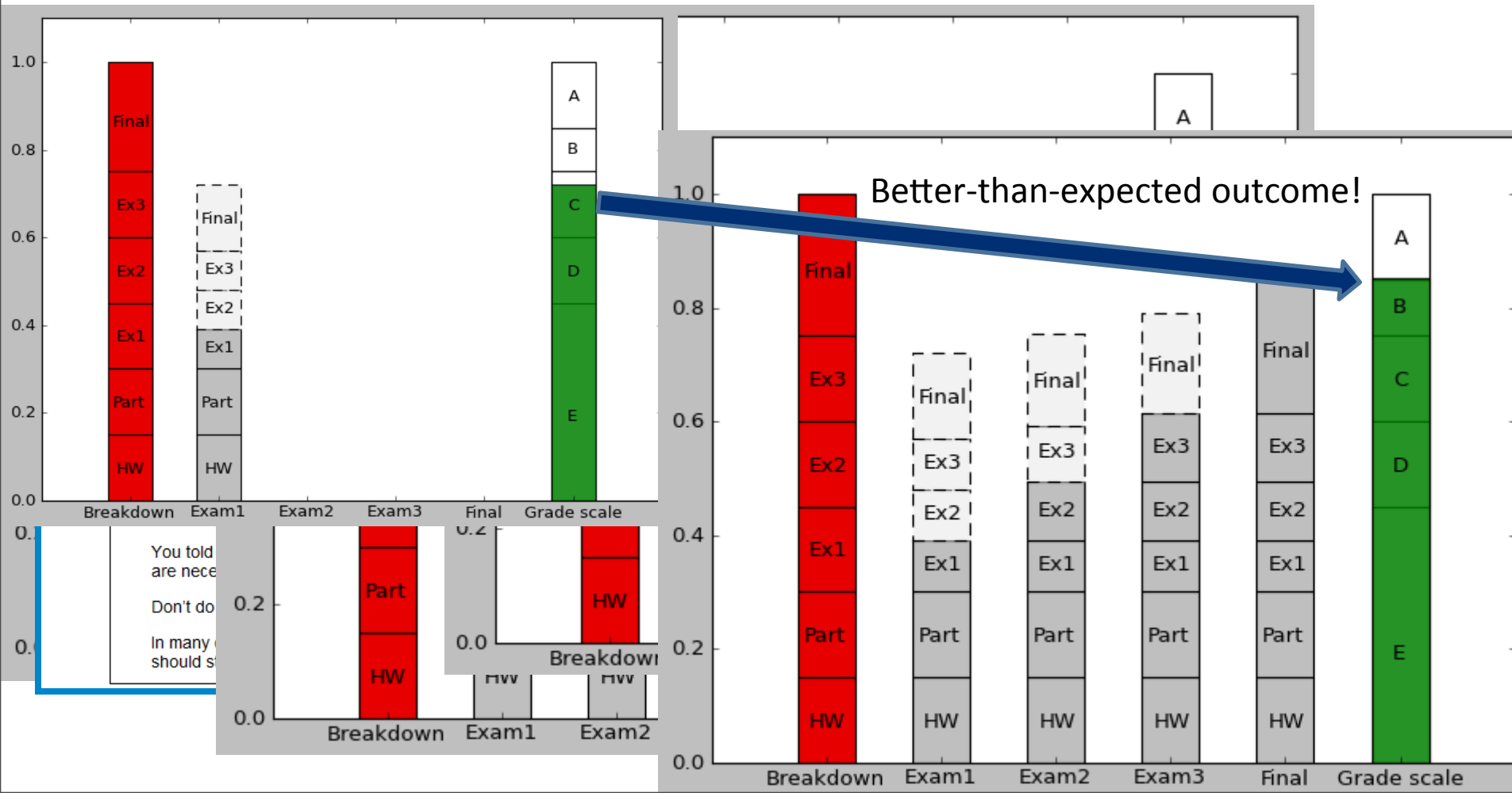
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Measurement of impact

- In/out plus usage measures to determine engagement with E²Coach
- Performance of students relative to historical prediction models
- Disparities on gender, SES, first-gen status
- This is a complex intervention, with many parts: which are key?
- Testing in fall using fractional factorial design
- Building on a legacy of rigorous testing in the public health community

Lessons learned

- Computer tailored communication provides a powerful, flexible model for **intervention engine**
- MTS adoption is practical
- It produces a rich suite of data for assessment and optimization
- This is not a technological problem, the real challenge is still in understanding
 - How to optimize response to detailed information about students? What do they have to do to succeed?
 - How to use normative information to motivate them to change?
 - How to better incentivize successful behaviors? How do we get them to change?

The future for tailored communication: an intervention engine

- At UM: expansion of BTE/WTE studies to other disciplines, across gateway STEM courses
- Going to the cloud to collaborate across institutional boundaries
- Developing an integrated system to support academic advising
- Tailored communication is a very generic tool
- Engine of a customized, interactive interface between students and relevant information and support, from orientation to graduation. A tool for informed connection.

Reminder about the SOLAR MOOC on Learning Analytics

Warped space lens provides x lak12 - home x Blackboard Collaborate | Se x Society for Learning Analyti x

lak12.wikispaces.com

Get started with Goo... iGoogle NYT WP WUND LSA ART LSA AdvFi lak12 course ADS SLAM UM Lib ECoach OED GSMget solar Birders PB pols_wiki

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lak12

☆ home

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Learning Analytics and Knowledge 2012 Syllabus

Click here to sign up for the course:
<http://lak12.mooc.ca/cgi-bin/login.cgi?action=Register>

This course is offered by the Society for Learning Analytics Research in advance of our 2nd international conference: <http://lak12.sites.olt.ubc.ca/>

Course Description:
Capturing and analyzing data has changed how decisions are made and resources are allocated in businesses, journalism, government, and military and intelligence fields. Through better use of data, leaders are able to plan and enact strategies with greater clarity and confidence. Data is a value point that drives increased organizational efficiency and a competitive advantage. Simply, analytics provide new insight and actionable intelligence. Companies such as Microsoft, IBM, Google, and Amazon are investing heavily in technologies and techniques in helping individuals and organizations makes sense of, and unlock the value within, big data.

In education, the use of data and analytics to improve learning is referred to as learning analytics. Analytics have not yet made the impact on education that they have made in other fields. That's changing. Software companies, researchers, educators, and university leaders are starting to recognize the value of data in improving not only teaching and learning, but the entire education industry.

This course will provide an (generally non-technical) introduction to learning analytics and how they are being deployed in various contexts in the education field. Additionally, the tools and methods, ethics and privacy, and the systemic impact of analytics will be explored, presenting a broad overview of the current state and possible future directions of the field.

Course Audience:
This course will be of interest to individuals across the full learning spectrum: K-12, higher education, corporate learning, and informal/life long learning. Leaders, educators, and even students will benefit from the topics explored and the related implementation issues (in particular, privacy and ethics of analytics).

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 - Week4_Semantic_Data
 - Week5_Privacy_Ethics
 - Week6_Tools_Techniques
 - Week7_Open_learning_Analytic
 - Week8_SoLAR

☆ Week1_Trends_Context

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Week 1: Trends and context: why learning analytics? Why now?

Date: January 23 - 29

Introduction:

This week is an introduction into the trends and context that are driving learning analytics. Parts of this week overlap with week 2 where we focus on defining analytics (in its many versions) in education.

We live in digital times. And times of information abundance and growing complexity. The conversations that used to evaporate are now increasingly digitized, waiting for a clever algorithm for analysis. The potential of analytics to increase employee efficiency, match the right people to the right tasks, and to improve access to help resources is tremendous. Businesses and governments have taken advantage of new data-focused tools and techniques to improve organizational efficiency and gain a competitive advantage.

When applied to learning - corporate, higher education, K-12 - analytics raise similar concerns about the interplay between the value between transparent data silos and privacy and ethics. This course will explore learning and knowledge analytics, including analytics methods and models, systemic application, potential data sources, the "soft/human/non-quantifiable" aspect of learning, as well as privacy and ethical considerations in deploying analytics.

In week one, we will focus mainly on building some familiarity with the concepts (and language) of learning and knowledge analytics. We define learning analytics as: "the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs".

Readings and videos:

- Baker, S.J.D., Yacef, K. (2009) The State of Educational Data Mining in 2009: A Review and Future Visions: http://www.educationaldatamining.org/JEDM/images/articles/vol1/issue1/JEDMVol1Issue1_BakerYacef.pdf
- Why the current interest in analytics in education?
 - [Technology and the completion agenda:](#)
 - <http://www.insidehighered.com/news/2010/11/09/completion>
- Untangling the social web-Economist:<http://www.economist.com/node/16910031>
- Marisa Mayer (Google), The Physics of Data:<http://www.parc.com/event/936/innovation-at-google.html>
- Industry partnerships: <http://www-03.ibm.com/press/us/en/pressrelease/36384.wss>
- Big data stupid decisions: <http://www.youtube.com/user/OreilJMedia#p/c/2542D0E253DD85CE/254YDEwbnwCo>

☆ Recordings

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- Week 1:**
Overview [\[Recording\]](#)
- Week 2:**
Ryan S.J.d. Baker [\[Recording\]](#)
- George Siemens [\[Recording\]](#) [\[Slides\]](#)
- Week 3:**
John Campbell [\[Recording\]](#)
- Week 4:**
Dragan Gasevic [\[Recording\]](#)
- Week 5:**
Erik Duval [\[Recording\]](#) [\[Slides\]](#)
- Week 6:**
Shane Dawson

Recordings of all the sessions which have happened already are available here



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