ECoach: Personalized Academic Coaching at Scale

Jennifer Ganger, Psychology
Lingfeng (Kitty) Liu, Chemistry
Jessica Wandelt, Biological Sciences
First Day of Class

• It’s the first week of the semester.

• *What do you want students to know in order to succeed in your class?*
  
  • Would that message be different depending on…
    • the grade they want?
    • their confidence in themselves?
    • their self-reported time management abilities?
First Exam

• It’s time to get ready for the first exam of the semester.

• What do you tell students to help them prepare?
  • Would that message be different depending on…
    • the student’s major?
    • their confidence in themselves and their ability to learn hard things?
    • whether they identify as a “math (science/literature/…) person?”
    • whether they’re caught up with all the work in the course so far?
After the Exam.

- Your office hours are crowded with distressed students who did poorly and want help.
  - Worse yet, many do not even seek help.
  - And what about the Bs and Cs who want As?
- What do you tell these students?
  - ...depending on exam score and goals?
  - Would that message be different depending on...(major, confidence, identity, self-efficacy, other coursework...)?
- Do you ever reach out without invitation? What do you say?
After the Second Exam.

• Now you have students who’ve done poorly on two exams.
  • Some are coming for help. Some are disappearing.
  • And you’ve still got the ones gunning for As.

• What do you tell these students?
  • Would that message be different depending on…(exam scores, identity, self-efficacy, other coursework…)?
ECoach: Background

• Large STEM courses, younger students
• Motivation, identity, stereotypes
• Meta-cognitive and self-regulatory skills
ECoach is a personalized coaching tool

- Developed at University of Michigan
- Allows tailored communication and interventions in large enrollment courses
This semester, we are piloting ECoach in 3 large lecture courses

- DB-SERC → SEISMIC → ECoach
- Funded by Personalized Education - Forge Your Own Path, Pitt SEED grant, and DB-SERC Course Transformation Award
ECoach is a separate website that integrates with Canvas

Canvas
- Grades/Gradebook info
- Roster

ECoach
ECoach is a separate website that integrates with Canvas

Canvas
- Grades/Gradebook info
- Roster

ECoach
ECoach uses course and grade info from Canvas as well as student surveys.

**Canvas**
- Grades/Gradebook info
- Roster

**ECoach**

**Self-report Survey**
Survey questions: General

• Prior classes
• How interested are you in <course/subject>?
• How useful do you think <course/subject> will be in your life?
Survey questions: Grade related

• What grade do you want to get in <course>?
• How confident are you that you can that grade?
• How motivated are you to get that grade?
• What’s the lowest grade you’d be satisfied with?
Survey: Motivation

• I want to do well because…
  • I’m interested in…
  • I’ll need to know … in the future
  • I don’t want my GPA to suffer
  • I might choose this subject as a major
  • I don’t want my parents to nag me
  • I want to prove to myself that I can do it
  • I don’t care about doing well
Survey: Self-efficacy

• I can learn what is being taught in <course> this term.
• I know I can be successful in <course> if I try hard enough.
• I will be able to demonstrate how well I know the material on exams in this course.
• I know I can pass exams in <course> if I put in enough work during the semester.
Peer Comparisons

• When you think about your peers in <course>, do you feel you know as much as, about the same, or less than your peers in <subject>?
• Compared with other students in this class, I expect to do well.
• I’m certain I can understand the ideas taught in this course.
• Compared with others in this class, I think I’m a good student.
• My study skills are excellent compared with others in this class.
• Mastery: I want to learn as much as possible from this class.
Survey: Identity

• I am a science person
• …math person
• …psychology person
Survey: Metacognitive Skills

• I ask myself questions to make sure I know the material I have been studying.
• Before I begin studying I think about the things I will need to learn.
Survey: Self-Regulation and Time Management

• When work is hard, I either give up or study only the easy parts.
• I work on practice exercises and answer end of chapter questions even when I don’t have to.
• Even when study materials are dull and uninteresting, I keep working until I finish.
• I make good use of my study time for my courses.
• I find it hard to stick to a study schedule.
• I make sure to keep up with the weekly readings and assignments for my courses.
Survey: Test Anxiety

• During tests I feel very tense.
• I seem to defeat myself while working on important tests.
• I feel very panicky when I take an important test.
• During exams, I get so nervous that I forget facts I really know.
Survey: Numeracy

• How good are you at working with fractions?
• How good are you at figuring out how much a shirt will cost if it is 25% off?
• How often do you find numerical information to be useful?
Survey: Major and Willingness to Seek Help

- Imagine you’re having trouble with something in a course -- anything from being confused about a topic all the way to a failing grade. Do you see yourself using any of these resources?
  - Office hours
  - One on one
  - Study group
Survey: Strengths and Values

- What are you good at?
  - I’m athletic
  - I’m creative
  - I’m good at my job
  - I’m organized
  - I’m trustworthy
  - I’m positive
  - I like to learn new things
  - I stay cool under pressure
  - I’m thankful

- What 2 or 3 of these do you value most in life?
  - Family
  - Friendship
  - God’s will
  - Health
  - Purpose
  - Mental strength
  - Responsibility
  - Physical strength
ECoach uses course and grade info from Canvas as well as student surveys.
What exactly does ECoach do?
ECoach provides personalized guidance

- Personalized posts
  - General and specific advice for various elements of the course
  - Guidance before and after exams (or any milestone event)
- Exam playbook
- Grade calculator
- To-do lists

➤ *Takes each person’s grades and survey answers into account*
ECoach provides personalized guidance

- Personalized posts
  - General and specific advice for various elements of the course
  - Guidance before and after exams (or any milestone event)

- Exam playbook
- Grade calculator
- To-do lists

➢ Takes each person’s grades and survey answers into account
Jennifer

My welcome message

Welcome | BIOSC 0805

I am so glad that you are here.

One of my favorite parts of this class (other than the biology) is the diversity of students that take it every year: students across many majors and years as well as backgrounds and interests.

I know that you do not think of yourself as a 'science person'. You are a bit nervous about how you are going to do, but please know that this class is truly designed for students with little to no background in biology and you are not alone: a lot of the students in the class are not science majors and are also nervous to be here. We will work together to find a successful path to meet your goals.

This class is very relevant to your daily life

This class will be very predictable

Read More
Welcome | BIOSC 0805

Jennifer I am so glad that you are here.

One of my favorite parts of this class (other than the biology) is the diversity of students that take it every year: students across many majors and years as well as backgrounds and interests.

I know that you do not think of yourself as a 'science person'. You are a bit nervous about how you are going to do, but please know that this class is truly designed for students with little to no background in biology and you are not alone: a lot of the students in the class are not science majors and are also nervous to be here. We will work together to find a successful path to meet your goals.
Welcome / Intro Post

A Snapshot Of You | Here’s What We Learned From You.

A Snapshot Of You | Here’s What We Learned From You.

IDEAS TO STAY ON TRACK THIS TERM...

Based on some of your other answers and what we know about Developmental Psychology, here are some questions to ask yourself, if you’re interested:

- Remote learning. You might want to check out these tips for successful remote learning.
- Studying. Not all studying is good studying. But you seem to have some confidence in your study skills. That’s a good start. ECoach is one place to go for study tips that are personalized for you and for this course. Even if you’re not interested now, you can come back any time during the term. Many students wait until it’s too late to get help. What early warning sign in your own performance might tell you it’s time to get help?
- Motivation. You seem pretty motivated to get the grade you want. But sometimes being motivated by outside forces (like focusing on a GPA instead of learning) can work against us. When we do things for reasons we don’t totally own, we may not actually be motivated. If you do well in this course, what other benefits would it bring you?
Studying. Not all studying is good studying. But you seem to have some confidence in your study skills. That's a good start. ECohach is one place to go for study tips that are personalized for you and for this course. Even if you’re not interested now, you can come back any time during the term. Many students wait until it’s too late to get help. *What early warning sign in your own performance might tell you it’s time to get help?*

Motivation. You seem pretty motivated to get the grade you want. But sometimes being motivated by outside forces (like focusing on a GPA instead of learning) can work against us. When we do things for reasons we don’t totally own, we may not actually be motivated. *If you do well in this course, what other benefits would it bring you?*
Less Risky Points | Don’t Miss Out On These

ABOUT ONE-THIRD OF THE POINTS ARE TOTALLY IN YOUR CONTROL.

35% of your grade in this course is in your control. Any single quiz question, participation submission, or homework assignment feels small. But, when you see it all together, it adds up to a third of all your points, and that’s a lot.

In the “less risky points,” we’re including:

- Quizzes
- Peerceptiv Assignments
- Participation
- Extra credit
ECoach provides personalized guidance

• Personalized posts
  • General and specific advice for various elements of the course
  • Guidance before and after exams (or any milestone event)

• Exam playbook

• Grade calculator

• To-do lists

➢ Takes each person’s grades and survey answers into account
Exam Playbook

CHOOSE YOUR TOOLS

Which resources will help you prepare for this exam?

Please take a moment to consider the types of questions that will be on the exam.

To achieve the grade that you want, what resources (listed below) do you think will help you prepare most effectively?

- [ ] Name That Scenario
- [ ] Lecture notes
- [ ] Past required HW problems
- [ ] Video recorded lecture
- [x] Past recommended HW problems
- [ ] Problem Roulette past exam questions
- [ ] Lab materials (ILPs)
- [ ] Textbook readings
- [ ] Formula card
- [ ] Study group (or discussion with classmates / students)
- [ ] Office hours with a lecturer
- [ ] Office hours with a GSI
- [ ] Asking questions in lecture or lab
- [ ] Private tutoring
- [ ] Practice exam questions (from Canvas)
- [x] ECoach

Next

LET'S MAKE A PLAN

Planning helps you achieve your goals. Please describe how you plan to prepare for your exam.

Nov. 4, 2016 | 10 a.m. - noon | Past required HW problems + Past recommended HW problems + Office hours with a GSI

<table>
<thead>
<tr>
<th>When?</th>
<th>What tools will you use?</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/8/2016</td>
<td>08:00 PM</td>
</tr>
<tr>
<td>Library</td>
<td>Past recommended HW problems</td>
</tr>
<tr>
<td>Problem Roulette past exam questions</td>
<td>Formula card</td>
</tr>
<tr>
<td>Office hours with a GSI</td>
<td>Asking questions in lecture or lab</td>
</tr>
<tr>
<td>Practice exam questions (from Canvas)</td>
<td>ECoach</td>
</tr>
</tbody>
</table>

What will you do?

It's best if your plan is specific, realistic and useful to you.

If you practice exam questions, how many questions do you plan to complete? In how many days?

Add to Playbook

Add more study events

Sync
ECoach provides personalized guidance

- Personalized posts
  - General and specific advice for various elements of the course
  - Guidance before and after exams (or any milestone event)
- Exam playbook ➔ Reflection and post-exam message
- Grade calculator
- To-do lists

➢ Takes each person’s grades and survey answers into account
Exam Reflection

Welcome back, Holly. You made it through your STATS250 exam. You scored a 57.0 out of 75.0 points or 76.0% which corresponds to a letter grade of a C+.

Here is where your exam grade falls in the class-wide distribution of exam grades:

How do you feel about your grade on this Exam?

- I'm disappointed
- I feel ok about it
- I'm happy

Next
Exam 2 Reflection | Where to go from here

Susan  IT’S GOING TO BE OK.

We know this must be a hard time. Getting two low grades in a row can really shatter our self images. Before you get too hard on yourself, though, please consider a couple of things...

It’s not over. Two really important things, here:

1. You still have about 30% of the points earn.
2. The exams aren’t cumulative.

Together, these are big. With each new exam, it’s like starting fresh. What if you can turn around your study habits and make a fresh start for the third exam?

Getting some help might be a good idea. Based on your Exam 2 scores, it looks like something is getting in your way. Maybe it’s personal stress. Maybe the material is harder than you expected. Maybe it’s something about your study habits. Maybe it’s all of it.

Whatever the reason, you’re in a resource-rich environment with lots of people standing by to help you. Advisors, GSIs, instructors, CAPS. Talking to someone could be your first step toward feeling better and finding hope.
Alexander, you have 7 weeks and two more exams to go. What’s the best way forward for you?

**WHERE YOU STAND IN STATS 250**

Try our [Grade Calculator](#) to explore what impact each future assignment has on your final grade.

- **Your grade now:** 51.1%
- **You could get:** 69.4% (C-, if you average **70s or better** from here on out)
- **You could get:** 79.1% (B-, if you average **80s or better** from here on out)
- **You could get:** 88.7% (B+, if you average **90s or better** from here on out)

**You seem to be struggling a bit in this course.** If you haven’t already, it’s probably time to reach out to an instructor or your advisor. They’ll work with you to figure out next steps.

If you’re interested, below we show you how you’re doing on some of the things we’ve found are important habits. See how you compare and what you might want to change.
ECoach provides personalized guidance

- Personalized posts
  - General and specific advice for various elements of the course
  - Guidance before and after exams (or any milestone event)

- Exam playbook
- Grade calculator
- To-do lists

➤ Takes each person’s grades and survey answers into account
Grade Calculator gives students multiple perspectives on their grade progress.

**My points**
See what percent of points you earned, you missed, or are still available.

100% are still available

You have no missed points.

**CALCULATE GRADE**
Select the grade categories below to edit individual scores and play around with your potential grade.

- All categories
- Quiz
- Group activity
- Homework
- HD project
- Discussion board

**Quiz:** 0% | 36.4% of total grade

<table>
<thead>
<tr>
<th>Assignment name</th>
<th>Score</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 2 quiz</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Module 3 quiz</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Module 4 quiz</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Module 5 quiz</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Module 6 quiz</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Module 7 quiz</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Module 8 quiz</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>
To-do lists give students a regular check-in to support building routine

- Students can mark completion and add other items
- Feedback can be tailored based on if they items are checked off

<table>
<thead>
<tr>
<th>To-Do</th>
<th>WEEK 2 (AUGUST 24-28)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study Lab tools for success</strong></td>
<td></td>
</tr>
<tr>
<td>Check out these great tools from Study Lab to master learning in different learning environments.</td>
<td></td>
</tr>
<tr>
<td>RESOURCE</td>
<td></td>
</tr>
<tr>
<td><strong>Office hours</strong></td>
<td></td>
</tr>
<tr>
<td>Due: Aug 26</td>
<td></td>
</tr>
<tr>
<td>Drop in office hours with Dr. Wandelt from 3:00-4:00 on zoom. This is a great chance to go over any homework questions before they are due.</td>
<td></td>
</tr>
<tr>
<td>ZOOM OFFICE HOURS</td>
<td></td>
</tr>
<tr>
<td><strong>Module 2 homework due</strong></td>
<td></td>
</tr>
<tr>
<td>Due: Aug 27</td>
<td></td>
</tr>
<tr>
<td>These questions are embedded in the Module 2 TopHat page. It is recommended that you start these on Monday to not be rushed.</td>
<td></td>
</tr>
<tr>
<td>TOPHAT HOMEWORK</td>
<td></td>
</tr>
<tr>
<td><strong>Live class review</strong></td>
<td></td>
</tr>
<tr>
<td>Due: Aug 27</td>
<td></td>
</tr>
<tr>
<td>This will be our first live class review! It will run from 6:30 -7:30 pm. These will offer a different take on the weekly content and help you to think about the material more broadly. Please check Canvas announcements for zoom link.</td>
<td></td>
</tr>
<tr>
<td>LIVE CLASS ZOOM</td>
<td></td>
</tr>
<tr>
<td><strong>Live group activity</strong></td>
<td></td>
</tr>
<tr>
<td>Due: Aug 27</td>
<td></td>
</tr>
<tr>
<td>We will have zoom breakouts for groups to meet to do the weekly group activity. These will run from 7:45-8:45. Please check Canvas for zoom link.</td>
<td></td>
</tr>
<tr>
<td>LIVE CLASS ZOOM</td>
<td></td>
</tr>
</tbody>
</table>
Why are we excited about Ecoach?
ECoach: potential

• Large STEM courses with high failure rates…
Large STEM classes often have high DFW rates

<table>
<thead>
<tr>
<th>Course</th>
<th>Average Enrollment (# of sections)</th>
<th>Reported DFW rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOSC 0150</td>
<td>280 (5)</td>
<td>21%</td>
</tr>
<tr>
<td>CHEM 0110</td>
<td>203 (8)</td>
<td>14-15%</td>
</tr>
<tr>
<td>CHEM 0120</td>
<td>205 (6)</td>
<td>13-14%</td>
</tr>
<tr>
<td>PHYS 0110</td>
<td>222 (3)</td>
<td>14%</td>
</tr>
<tr>
<td>PHYS 0174</td>
<td>200 (4)</td>
<td>20%</td>
</tr>
<tr>
<td>MATH 0220</td>
<td>71 (16)</td>
<td>41%</td>
</tr>
<tr>
<td>PSY 0010</td>
<td>333 (5)</td>
<td>6%</td>
</tr>
</tbody>
</table>
Students who interacted with ECoach earned about a third of a letter grade higher than students who didn't use it.
Better-than-Expected (BTE) Measure

- BTE: Compare class performance in ECoach class ($G_{actual}$) to that of other students in the class with a similar GPA in their other classes ($GPA_{other}$).

What’s the average grade in this class for people with a specified GPA in other classes?

What is this student’s actual grade?

$$BTE(G_{actual}, GPA) = \frac{G_{actual} - G_{exp}(GPA)}{\sigma_{exp}(GPA)}$$
Mean BTE scores achieved across the four different user groups (nonusers, low users, moderate users, and high users).

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0137001
This semester, we are piloting ECoach in three large lecture courses

- BIOSC 0805: The Human Body for Non-majors
- CHEM 0310: Organic Chemistry 1
- PSY 0310: Developmental Psychology
We have four goals for the ECoach pilot

• Learn the system
• Evaluate student engagement
• Begin to evaluate effectiveness
• Share our experiences
Student engagement

• We are offering extra credit for students to do surveys and exam playbooks
• Everything in between is optional
• ECoach tracks student usage
• End of Term survey
We have four goals for the ECoach pilot

• Learn the system
• Evaluate student engagement

• **Begin to evaluate effectiveness**
  • Is usage associated with better grades?
  • With better than expected grades?

• Share our experiences
We have four goals for the ECoach pilot

• Learn the system
• Evaluate student engagement
• Begin to evaluate effectiveness
• Share our experiences
Share Experiences

• Interest
• Research possibilities
• Thanks to
  • Bobby Ackerman and Lorna Kearns @ UCTL
  • Tim McKay, Holly Derry, Ben Hayward, Caroline Carter, David Nesbitt, Caitlin Hayward, Anna Darnel @ UM Center for Academic Innovation
  • SEISMIC

• This work is supported by
  • Pitt SEED grant
  • Pitt Personalized Education: Forge Your Own Path grant
  • dB-SERC Course Transformation Award (AY21)