



REALISE

Realising Inclusive Science Excellence

January 2019

Highlights:



Your 2019 [teaching resolutions!](#)



[CHEM 111 curriculum redesign](#)



[Spring STEMEd reading group](#)
starts January 25th
@ 1 PM



[What is REALISE?](#)

Your 2019 teaching resolutions!

What is the most useful lesson you learned related to teaching in Fall 2018?

I learned that students appreciated the posted learning objectives at the beginning of a new chapter. These learning objectives were reviewed during every class.

-Amy Balija

Teaching strategies need to be fluid and adjust for each class environment. What works for one group of students might not for a different group of students.

-Elizabeth Becker

I taught a Biology 460 seminar on the Biology of Death that was a metric ton of fun. Working with that group taught me that sometimes you learn best when you're all learning together. The instructor doesn't have to know all the answers going into a topic; when you're open to discovery you can grow new insights as a group.

-Jason Davis

For this fall, I used the information from the "Project-Based Learning" workshop in January to incorporate PBL

into a class for the first time. I learned that the majority of the work to do this occurs before the class even starts. The goal is to find a project that students can do. And then - unlike so many open-ended and less defined "class projects" - I had to pre-define individual goals and their due dates so that students could scaffold their work for their final product. Their final product was a poster that described the energy use of a campus building. At each due date I had to give students specific (i.e. graded) feedback on each particular aspect of the project. By going this route, the students' work was spread out throughout the semester, resulting in a better project one done solely in the final days of the semester.

-Rhett Herman

I need to spend more time introducing myself, my expectations, and why I have those expectations at the beginning of the semester.

-Tara Pelletier

Students prefer to learn from apps rather than reading textbooks.

-Orion Rogers

Backward course design has been useful in helping me with the triage associated with revising an introductory genetics course to the genomics era.

-Bob Sheehy

I knew it would be challenging to redesign (overhaul!) my courses, but I learned that it is not only feasible but also a bit invigorating. Last semester, I restructured "Forest & Wetland Ecology" into a project-based course, tasked with conducting a health assessment of the forests at Wildwood Park.

Although the learning goals did not change dramatically, I realized that having a central theme and real-world focus helped to unify course content and skills. Learning to identify trees, characterize site environments, and analyze soil chemistry had greater context; students had a reason to learn them – to be competent to carry out this research. Having a real-world focus and public product also seemed to increase buy-in. Students created a [website](#) describing their work – what they did, what they found, why it's important – and linked this to the Wildwood Park public website so the local community can learn about their findings. Students were particularly excited (dismayed) that they discovered the first occurrence of the Emerald Ash Borer – a new exotic insect pest – at Wildwood Park, and some will be expanding on this through independent research in the spring.

I also experimented with extended research projects in my freshman ecology course. Students developed projects during the last eight weeks of the semester and presented them at a college-wide research symposium. I was encouraged at how effectively student teams functioned and the pride and engagement they showed in projects.

-Christine Small

What is one teaching goal you have set for yourself in Spring 2019?

My teaching goal is to find alternative, effective ways for students to be evaluated instead of through standard testing methods.

-Amy Balija

To develop new resources for students that will help them be successful.

-Elizabeth Becker

To let courses grow as they go. I know the primary learning outcomes I'm aiming for, but there's always a secondary set of subsidiary objectives that sort of make themselves present as things go on. I'm trying to structure my upcoming courses so that the ability to flow and change is built into them, so that the students get

to put their own spin on the lessons they encounter.

-Jason Davis

I'm working to implement the Action Plan for BIOL 232 that I developed last year as part of the faculty learning community. In particular, I am implementing lab exercises that involve students in designing research projects, collecting and analyzing data, and drawing conclusions. These exercises intentionally build on skills introduced in BIOL 131.

-Joel Hagen

I am going to make the PHYS 309 - Electronics Laboratory class into more of a project based learning class, moving away from the old confirmation-verification labs and giving students greater ability to explore electronics concepts and applications as they build real-world hardware. I am doing the same in the PHYS/GEOL 406 - Geophysics class. The project will be a community partnership whereby my class will perform a professional-level geophysical site survey on 13 acres of land on which a local organization would like to locate a particular high-tech industrial client. This will again give students the opportunity to take their classroom theory and apply it to the off-campus world and have a finished product (their full site report) to show to potential employers as they get closer to graduation.

-Rhett Herman

I am working on incorporating more current examples that my students can relate to in my lectures and class activities, particularly for the 105 non-majors course.

-Tara Pelletier

Develop assignments and projects that require students to work in groups where they teach each other and provide academic and social support to each other.

-Orion Rogers

I will be teaching Bioinformatics this spring. Last time I taught the course a large component of the content involved an introduction to programming using the Python programming language. Student response to this was, to be generous, lackluster. This semester I would like to have another go at introducing programming but at a lower, more focused level. This would involve baby steps in MS word and Excel and perhaps, where appropriate, in R. In the end I would like the students to consider simple programming as a viable if not preferred approach to completing repetitive tasks and data analysis.

-Bob Sheehy

What is one change you are planning to make to help your Spring 2019 courses become more inclusive?

I am trying to include real-life assignments in my class so that students can relate my course to their future careers. I also want to incorporate peer-peer reviewing in their final assignment.

-Amy Baliya

Course materials need to be visual , audio and lots of hands on as each student needs to have materials geared to their best way of learning.

-Elizabeth Becker

I'm team teaching new courses that I've never taught before (Biology 489: Darwin & Victorian Science and Honors 310: Evolution the Boardgame) so it isn't really a change, but I'm really working on making the material and the assessment accessible from multiple angles. I want to provide as many entry points and approaches as realistically possible so that each student can direct their own path of learning; they should all (hopefully) get

where we're going, but everyone should be able to take a slightly different route to get there.

-Jason Davis

I am using an open source textbook in BIOL 232 to reduce the cost of education for students. This poses a challenge to find additional on-line sources of information in order to provide comparable coverage to what is provided by the commercial textbook that I used previously.

-Joel Hagen

The project-based learning that I am incorporating into my upper level classes has been [shown to promote inclusivity in the classroom](#) by placing decision-making in students' hands as they become full research partners through their own hands-on work. They will have a final tangible product from these classes - either the electronics hardware they have designed and built or their final geophysical site survey reports built from the data they have obtained themselves.

-Rhett Herman

I am hoping that spending a lot more time at the beginning of the semester talking about what my class is about and walking through where everything is on D2L, will better help students with no prior knowledge about what it means to be in college. I am also testing out a Kickbox Minigrant idea in BIOL 105 that I think will bring us together more as a class!

-Tara Pelletier

Invite students in risk of failing or withdrawing to lunch through Highlander Chats and demonstrate that I care about their academic success in our course and during their time as a student at Radford.

-Orion Rogers

I plan on incorporating more opportunities for formative assessments; both individual and group. These will be closely tied to summative assessments, which will be largely individual but may also contain a group component.

-Bob Sheehy

In trying a project-based approach to my "Forest & Wetland Ecology" course, it is more apparent than ever that one size doesn't fit all. Although many students said that they worked harder, learned more, and gained important career skills, some were less comfortable with the open-ended nature of a project-based course. This spring, I want to take more time to talk with students about the role of "uncertainty" and importance of problem-solving in science. I think students will feel more comfortable knowing that exploring, troubleshooting, and dealing with the unknown are a purposeful part of the course and critical to learning – that science can be messy, unorganized, and take a lot of time, and does not come with a step-by-step to do list. I also want to build in more time for student feedback and reflection – asking students about their interests and concerns, and to think about what they are learning, why it's important, and how it relates to their own goals.

-Christine Small

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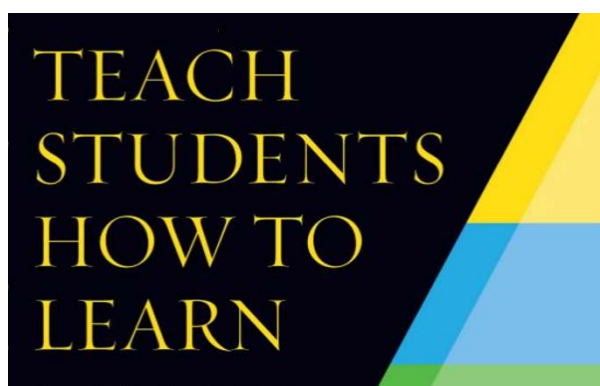
New CHEM 111 curriculum debuts!

By Kristina Stefaniak

This summer 8 of the chemistry faculty members met to reinvigorate the general chemistry lab curriculum. Two great outcomes of the summer workshop include the creation of an inclusive checklist and revised learning objectives for the General Chemistry sequence. The goal of the redesign was to make clear connections between what students did in the lab to the world around them. All CHEM 111 labs were developed or rewritten to explicitly help students make real world connections. These labs will be implemented this spring. Additionally, we developed an assessment tool to evaluate the effectiveness of the changes. The workshop design and initial results will be presented at the ACS Spring 2019 National Meeting, and as we collect more data from our IRB approved assessment tools we will look to publish our findings.

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STEMed Reading Group



**Last Friday of the month
@ 1:00 PM in CS 286**

*Hosted by the Center for Innovative
Teaching and Learning
and the REALISE Program*

The Spring 2019 STEMed Reading Group book is *Teach students how to learn* by Sandra McGuire (Stylus Publishing, 2015).

By meeting regularly throughout the semester to discuss this text, we hope to create a community of scholarly dialogue around teaching, blending the best ideas of experts with the local wisdom and experience of our faculty.

Come when you can! The readings are modular, such that discussing any topic in isolation will still be valuable. **Faculty are welcome to attend any/all session(s).**

[Email us](#) for a free copy of the book!

Date

Topic

January 25

Chapters 1-3
Sandra's journey: From traditional instructor to academic transformer

Why don't our students already know how to learn?
Metacognition: What it is and how it helps students become independent learners

Chapters 4-6

February 22

The power of teaching Bloom's Taxonomy and the study cycle to students
Metacognitive learning strategies at work
Mindset matters

Chapters 7-9

March 29

Connections between motivation, positive emotions, and learning
What faculty can do to boost motivation, positive emotions, and learning
What students can do to boost motivation, positive emotions, and leaning

Chapters 10-12

April 26

Partnering with your campus learning center
Teaching learning strategies to groups
Teaching unprepared students

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Request for Proposals: **Kickbox Minigrants**

Want to learn more?
Check Out D2L!

Kickbox Minigrants are a virtual "box" of resources that **kickstart** faculty-student making-themed or project-based learning pilot projects.

Awards are up to **\$500**.

Reach out before you write:

[Tara Phelps-Durr](#) or [Jeremy Wojdak](#) can work with you to clarify grant guidelines and make suggestions that might sharpen your proposal.

We are compiling a growing library of shared resources on the REALISE program's [D2L page](#). On tap:

- Writing welcoming syllabi
- Group work
- Project-based learning
- Microaggressions
- The Kickbox Minigrant RFP
- REALISE project details
- ... and more!

Contact [Tara](#) to be added to the REALISE D2L page.

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What is REALISE?

The challenge: From 2013-2015, Biology, Chemistry, and Physics retained ~50% of new majors. Another subset persisted, but didn't thrive academically or engage in the experiences we know are most impactful for our students.

The goal: To improve student success through strategic, evidence-based reforms targeting freshman, sophomore and transfer students.

The rationale: We know close student-faculty relationships, mentored research, student STEM clubs, and the like are amazing for our students. But we lose ~1/2 of our students before they can participate in our most valuable experiences. More students will succeed if we can provide those experiences earlier, and critically, provide them within courses where they are available to everyone.

What REALISE offers faculty:

- Support to pursue impactful and inclusive educational practices, such as project-based learning and course-embedded research projects.
- Opportunities to just talk with your colleagues about what works for them, in their classrooms.
- Time – time to reflect, think, plan, and implement the kind of lessons you wish you had the time to do.

What REALISE offers students:

It may be surprising, but most students drop out of STEM not from disinterest or inability to meet the academic challenges, but because they don't feel like they belong, or don't feel welcome. Thus, REALISE is trying to generate stronger social and academic support networks among student peers and between students and faculty.

An open invitation...

Whether you are interested, excited, nervous, or skeptical, we'd love to meet with you on-on-one to chat about how we can:

- Help you share your own expertise and experience with others.
- Use your concerns to improve the project as we go.
- Help you find what you need to try something new in your course (e.g., materials, time, technical/instructional expertise).
- Help you identify a part of the initiative that resonates with what you already do and value.
- Plan for how you can get involved.
- Figure out what the heck "Inclusive Excellence" means.

Contact [Sarah](#), [Tara](#), or [Jeremy](#) and we can share ideas over coffee.

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