Engaged Student Learning:

Essays on Best Practices in the University System of Georgia

volume 1, 2019

UNIVERSITY SYSTEM OF GEORGIA

Edited by
Denise P. Domizi

Engaged Student Learning

About the Book

Engaged Student Learning: Essays on Best Practices in the University System of Georgia is a publication of the University System of Georgia. It arose from a desire to recognize the excellence of all individuals who had been nominated for one of the prestigious Regents' Awards for Teaching Excellence. These awards are the USG's highest recognition of teaching and illustrate the USG's commitment to ensuring academic excellence for the citizens of Georgia.

People

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Peer-review team

The essays contained in this volume went through a double-blind peer-review process. The USG would like to thank the following reviewers for giving insightful feedback to the authors of this publication:

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Engaged Student Learning: Essays on Best Practices in the University System of Georgia

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* 2019 Regents' Award winner

Foreword

From Momentum Year to a Momentum Approach: Innovation at the Course Level

When we initiated the Momentum Year program in the University System of Georgia two years ago, the focus was to introduce and scale up across USG institutions a set of elements that the data show correlate with student success.

In the fall of 2017, we introduced elements of the USG Momentum Year:

- Making a purposeful program choice
- Creating a productive Academic Mindset
- Attempting the first 30 hours of a Clear Pathway
- Attempting 9 hours in Academic Focus area
- Completing initial English and Math

In 2018, each USG institution developed a campus Momentum plan that enacted these elements within the institution. Significant changes in the way that advising and co-requisite instruction occur have emerged from the impetus of Momentum. Additionally, the centrality of mindset to student success is a topic now being deeply explored across multiple USG projects.

In 2019 and beyond, the reach and impact of Momentum design will be felt across the undergraduate experience, forming what we can now confidently name the Momentum Approach. Considerations of breadth across the years of the undergraduate experience is one way to extend the Momentum Year to Momentum Approach, and depth is a second way, as students can experience a new approach within every course across the undergraduate curriculum. To enhance student engagement, learning, and success, faculty teaching individual courses have already set about applying the student lens to course, unit, and assignment design.

This book, Volume 1 of *Engaged Student Learning*, emerges from our traditional Regents Awards for Excellence in Teaching. The authors are faculty nominated by their institutions for teaching innovation and excellence, and a portfolio of their work has already been considered in the annual Regents Awards process. Now, our Office of Faculty Development has created a publication whereby the nominated faculty are invited to submit a brief essay on a best practice that has led to greater student learning and success. This peer-reviewed publication connects individual course innovations to the larger Momentum Approach design and offers faculty one forum to display their best student success pedagogies and course activities.

Dr. Tristan Denley
Executive Vice Chancellor and Chief Academic Officer
University System of Georgia

Preface

A Focus on Faculty Excellence: USG's Office of Faculty Development

When I came to the University System of Georgia after ten years at Emory's Oxford College, I gained a new set of faculty colleagues—twelve thousand of them to be exact— from across the system. The move invited a series of opportunities—to work in public higher education again, to join the academic team in a state known for its innovative approach to student success, and to reimagine how to support faculty across an incredibly diverse array of institutions.

Working with the committee of faculty who evaluated the portfolios submitted for the 2019 Regents Awards for Excellence in Teaching, I quickly discovered that good teaching strategies included in the portfolios far outnumbered the awards that the committee had to offer.

Would it be possible create a way to share these strategies with USG faculty? Denise Domizi, our Director of Faculty Development, had ideas for a publication that could showcase the good work that is happening across Georgia. Denise's expertise and that of the teaching and learning center directors who participated in the review process led to this book.

The authors of the essays in *Engaged Student Learning* are faculty nominated by their institutions for teaching innovation and excellence. We are excited to include some of their best practices in this inaugural volume.

Jeffery Galle, Ph.D., Associate Vice Chancellor for Academic Affairs
University System of Georgia

Editor's Introduction

Denise P. Domizi, Director of Faculty Development
University System of Georgia

While teaching at the University of Georgia—first as a graduate student and later as a faculty member with the Center for Teaching and Learning— I was always thinking about pedagogy and how to improve student learning. I read books and articles, talked with colleagues from all over campus, went to teaching conferences, and even engaged in some informal "pints and pedagogy" events with my graduate students. I constantly thought about student learning and loved hearing about the inventive ways that colleagues tackled challenges in the classroom.

Now, as director of faculty development for the University System of Georgia, I am afforded a birds-eye view of the classroom, my interactions being mainly with faculty and with other educational development professionals. Though the scope of my work has changed, I remain an avid consumer of sound teaching practices, and it is exciting to have the opportunity to celebrate them in this book.

Each year, the University System of Georgia accepts nominations from the twenty-six institutions in the USG for the prestigious Regents' Awards for Excellence in Teaching. These nominees have been recognized by their provosts for doing exemplary work in the categories in which they have been nominated, and they represent the best of Georgia and the USG. Though we receive seventy to eighty excellent portfolios each year, only nine awards are given. Last year, Jeffery Galle, USG's Associate Vice Chancellor for Academic Affairs, asked if we could find a way to honor all of these exceptional nominees, and thus *Engaged Student Learning: Essays on Best Practices in the University System of Georgia* was born.

This year, all Regents' Awards nominees were invited to submit a "best practices" piece highlighting student engagement in their face-to-face or online classroom. These essays, which went through a double-blind peer review process, represent all four institutional sectors in the USG: research universities, comprehensive universities, state universities, and state colleges. Authors are from a range of disciplines and their essays span from very specific, content-driven innovations to more broadly-applicable strategies that could be modified for many different classroom settings.

For example, in *Forensic Facial Reconstruction: Integration of Science and Art,* authors Marriott and Clark describe a two-semester long project where forensic science majors integrate history, anthropology, science, and art to create facial reconstructions from skulls, first focusing on the scientific literature to ascertain ethnicity, sex, and age, and eventually reconstructing faces based on these multidisciplinary resources.

In another example of a context-specific essay, Willox and Ponder describe a role-play activity in *UWGLive: Providing Simulated Classroom Experiences to Pre-Education Majors.* In this simulation, pre-service teachers have the opportunity to practice interactions with students and parents through online role-play, allowing them to receive guided feedback before entering an actual classroom. In each of these cases, instructors could simply model the behaviors they expect to see, but instead they ask the students to engage—and sometimes struggle—directly with the problems at hand, while experts standby to scaffold their learning.

Some essays outline general techniques that could be applied in a variety of contexts, from Utschig's *Team-Based Learning in Nuclear Engineering* to Trivedi's *Storytelling to Cultivate Growth Mindset and Social Belonging.* Others describe instructor-led behaviors and focus on how the organization and timing of the course activities (Joyner) or "meeting students where they are" (Loda) facilitates learning environments that help students meet their full potential.

When I read these essays, I can't help but imagine the events that sparked these classroom practices, the questions and wonderings that inspired these instructors try something new, and the conversations with colleagues and students that led them to think, *what if…?* They speak to a commonality—that we want students to be actors in their learning, rather than spectators. As Terry Doyle says, "the one who does the work does the learning" (2008, p. 63). In other words, if we give students agency and create learning environments that encourage them to take on the work of organizing, planning, synthesizing, and creating, they will learn.

As you read these essays, I challenge you to consider the underlying constructs of these pedagogical strategies, to think about what aspects of them you might use to overcome challenges in the classroom, and determine how they could help your own students to learn and reach their full potential.

Storytelling to Cultivate Growth Mindset and Social Belonging

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Author Biography

Nirmal Trivedi, PhD, is Director of First-Year Seminars and Assistant Professor of English at Kennesaw State University. His research integrates the disciplines of English and American Studies with the Scholarship of Teaching and Learning. He was awarded the 2019 Excellence in Teaching First-Year Seminars Award from the National Resource Center for The First-Year Experience and Students in Transition. Under his direction, Kennesaw State University's First-Year Seminar Program was awarded the inaugural USG Regents' Momentum Award for Excellence in Teaching and Curricular Innovation.

At our large (35,000 students), 4-year public university in a metro urban area, most students take a First-Year Seminar in their first semester. For the first unit of the course entitled "Academic and Social Belonging," I developed a new assignment that could help students address some of the social and emotional challenges that come with the transition to college. As a literary scholar myself, I understand the power of stories and storytelling to transform lives.

In order to ease students into the assignment, I introduce students to the concept of storytelling in a very simple way. Borrowing guidelines developed by education specialists with the storytelling organization "The Moth," I tell my students that every good story has three components: a transformation, high stakes, and authenticity. I tell them that even though they have only recently met each other, and that each of them is new to college, they all have personal stories of transformative change when they were faced with a challenge that seemed unsurmountable. By telling these stories of facing challenges to each other, whether or not the challenges were "overcome," each of us will gain an appreciation for our collective resilience and that this well of inner strength can be summoned throughout the very challenging (and exhilarating) first year of college.

The assignment is informed by social psychology research on growth mindset (Dweck 2008) and on the impact of cultivating "belonging" in improving educational outcomes (Walton & Cohen 2011). Research on mindset tells us that human capacities and intelligence are not fixed but can be developed over time and research on "belonging" has shown how modest interventions that normalize the experience of struggle in school can build resilience in students, especially those who harbor a contingent sense of belonging. The title of the assignment, the "Not Yet Story," is inspired by Carol Dweck's experiment in a Chicago school where students were given a grade of "not yet" instead of a failing grade.

The "Not Yet Story"

I introduce the "Not Yet Story" during the second week of the semester when students have developed some initial inchoate impressions of each other. It is a time when they have not developed their own sense of belonging in the class and are eager to know more about each other. To give students an understanding of overall goal of the assignment, I provide them with the assignment sheet and rubric before introducing the key psychological concepts and techniques of storytelling. Below is the description they receive.

*The "**Not Yet Story"** is a personal story you will tell to your fellow students about a **moment in your life when you had a learn something difficult**. To prep for this assignment, follow these steps:*

1. *What was it that you were trying to learn? What made it so difficult? What was "at stake?" for you or for others?*
2. *Review Carol Dweck's TED Talk, "The Power of Believing You Can Improve" and ask yourself how it might relate to your "not yet" moment.*
3. *Listen to stories from "The Moth." In class, we listened to two stories and you listened to two more stories on your own. Ask yourself how these stories established the following:*
    a. *The stakes (the importance). Why did a particular important moment matter to the storyteller?*
    b. *The transformation. What changed from beginning to end for the world around the storyteller?*
    c. *The authenticity. How did the storyteller convey the authenticity of the experience?*
4. *Develop your own story to present. You can choose how to tell the story. For stories told orally or as an audio recording, you will have the option to share the story in class.*

You may be wondering what this project has to do with what we are learning in class about how to succeed as a college student. As you now know, it's critical to develop a sense of belonging in college, both socially and academically. You've also learned how learning itself takes:

- *A **growth mindset** of "I'm not there yet, but I will be,"*
- *A "toolkit" of **learning strategies** that you can use depending on the situation, and*
- *The ability to be "**metacognitive**," or, reflective about your learning before you learn, while you learn, and after you learn so that you know how to improve.*

This project asks you to integrate these two concepts (Belonging and Learning) and tell a personal story to an audience of your peers.

The rubric only has a two-point scale from exemplary to "not yet" the four criteria are Mindset, Learning, Reflectiveness, and Presentation. If any presentation receives two or more "not yet" marks, the student has the option to revise their work for a better grade.

Storytelling Sessions

The stories told in class are stunning. They reveal the personal challenges and triumphs that each student carries with them before entering our classrooms. The class is transformed from a place in which a student and teacher have an adversarial relationship where the student needs to "game" the class for the best grade possible, to one in which each recognize in each other our diversity, resilience, and value. Decades of educational research has shown that once students feel respected and valued by their teachers and fellow students, their potential for academic success increases dramatically.

Some representative stories include:

- *The loss of a parent at a very young age and the self-education that followed;*
- *The fears of how one's body is developing and overcoming an eating disorder;*
- *The pressures of being an athlete, working full time, keeping up a decent GPA, all while being the first in their family to get into college.*

We are careful in these storytelling sessions to listen without computers and mobiles. We listen and we acknowledge our deep histories. As the instructor, I direct us to the themes of personal resilience and the college experience. By the end of this first unit, the students trust me and each other so deeply that the next assignments and group projects are more focused on educational learning outcomes as fears of not belonging subside.

References

Dweck, C. S. (2008). *Mindset: The new psychology of success.* Random House. Chicago.

Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, 331(6023), 1447-1451.

Local Landmark Analysis Essay

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Author Biography

Courtney George is an Associate Professor in the Department of English at Columbus State University in Columbus, Georgia. She teaches courses in American literature, southern studies, and First Year Composition, and she was CSU's Teaching Excellence Award Winner for 2017-2018. Dr. George's early published research focuses on southern women writers, while her most recent work focuses on portrayals of Hurricane Katrina in literature, film, television, and music.

Context

In an American literature course, I veer away from analysis of solely literary texts. I want to ask broader questions about how we construct history—whether in literature or in monuments: how do we tell stories about our local landscapes? How do we memorialize the events that once occurred in the places where we now take up residence? What is at stake in how we tell these stories?

Significantly, the debates surrounding symbols, memorials, and monuments have reached a crisis point in recent years, particularly in the southeastern region of the United States, and often specifically centering on how we remember ante- and post-bellum Civil War society. Two contemporary examples represent a culmination in such debates: activist Bree Newsome's removal of South Carolina's Confederate battle flag from the state house in 2015, and the explosive violence that occurred after Neo-Nazi groups gathered at a statue of Robert E. Lee in Charlottesville, Virginia in 2017. In Georgia, we might remember the challenges to and eventual changes to our state flag, which once incorporated an image of the Confederate battle flag and now incorporates the first national flag of the Confederacy. These debates, contestations, and changes relate to extant legacies of slavery, the Civil War, Jim Crow, and systemic racism and violence, but they also reveal much more about how we construct narratives, historical or otherwise.

In *Beyond Katrina: A Meditation on the Mississippi Gulf Coast* (2010), poet Natasha Trethewey describes the power dynamics present in man-made monuments, symbols, and memorials:

> *Never neutral, they tend to represent the narratives and memories of those citizens with the political power and money to construct them. Everywhere such monuments prescribe a particular narrative on the landscape while—often—at the same time subjugating or erasing others, telling only part of the story (55).*

Inspired by Trethewey's own meditations, and especially considering the debates about symbols and monuments in the American South, I asked students to locate, meditate, and write about landmarks in their community.

Goals

Students were to seek out and analyze a local landmark in a short two-page narrative essay. For these purposes, the landmark must reflect on local history, which includes historical markers, historical buildings, museum exhibits, and other memorials and monuments. I restricted students' choices to the surrounding area to encourage them to interact with places they encountered daily. *The Historical Landmark Database*, a web-based location search tool, was used as a starting place.

I had several main goals for students:

- To consider how history and narrative are enacted on local landscapes and related to other regional, national, and global narratives;
- To transfer and apply critical thinking to real-world contexts; and
- To combine analytical skills and emotional reflections and connect critical thinking with human emotion.

Structure of the Activity

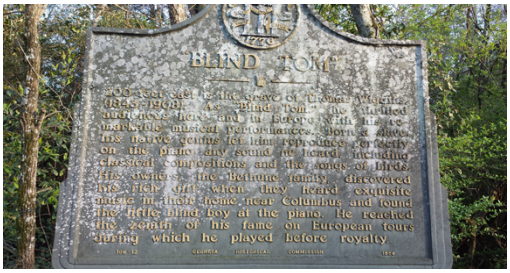
I asked students to spend some time in the physical space and photograph the landmark. In their narratives, they should use critical thinking skills to analyze the landmark and also respond with their affective reactions and reflections. Along with the goals listed above, the following questions worked as the main assessment tool for the essays.

- What is the landmark meant to represent?
- Within what kind of space or place is it situated?
- Who sponsored the landmark, and when? Who do you think their target audience is/was?
- What information is provided? (Use specifics/quotes)
- What did you learn from the landmark?
- What important context might be missing?
- Describe your emotional response to the landmark and the space.

I assigned this essay in the context of an upper-level American literature course, but it translates to other courses and disciplines. The assignment offers students the opportunity to learn about the local environment, which may be new to incoming students. The real-world aspects could be expanded to include a web-based map of the landmarks with links to students' photos and writing. Students also expressed that they would have enjoyed a related group activity, where we traveled to a monument or museum to discuss our responses together. Students' responses—whether in individual essays or in group conversations—might also be paired with further action outside of the classroom to promote social change or in conjunction with a service-learning requirement.

Student Responses

Students remarked on their enjoyment of this assignment in course evaluations, and the overall class average was 89%. The following essay excerpts show how this exercise fostered an application of critical thinking and emotional reflections in the context of local, regional, national, and global narratives.



"… the historical marker…reminded me of Blind Tom's obscurity in society as a whole. This little moment got at a deeper point about the South, the rich history it contains, and the secrets hidden beneath what we do know within history. Because Blind Tom was a slave—and a blind slave at that—he did not have license to go and make his own decisions."

(photo and excerpt used with permission from Hannah Coiner)

"[The house] is described as 'comfortable,' and reveals that some slaves were fortunate 'to [work] in affluent homes as cooks and domestic servants. Trained as seamstresses, dressmakers, cooks, butlers, and coachmen, many were skilled craftsmen…The furnishings…give an idea of what a relatively comfortable dwelling would have looked like.' If [this was] anyone's first encounter with slave conditions, he or she would leave blissfully unaware of a realistic portrayal of a slave home…, not knowing that this recreation is meant to make him or her feel more comfortable. Who was this comfortable for? The slave, or the people endorsing the display?"

(photo and excerpt used with permission from Jasmen Dickerson)

"It's very surreal to think that this bridge, one that I've crossed nearly every day for the past three years, was once the center of a literal warzone, and not really even all that long ago in the grand scheme of things…these kinds of reflections put into perspective the unprecedented nature of the Civil War as a whole, one that's perhaps all too easy to become desensitized or hardened to based on how we're often taught about it. This was not some faceless, foreign war sparked by some bout of international politics too complex for most of those fighting it to follow. It was a homegrown conflict that pit neighbor against neighbor, and they knew why it was happening. But, craziest of all, it happened here*."*

(photo and excerpt used with permission from Alex Proft)

"…All the advertisement of the confederacy did not transfer over to the actual cemetery…I did not see one confederate flag throughout the entire cemetery. I was beside myself about this because I was convinced that I would be surrounded by rebel flags both engraved and waving. The only flag that flew was the American flag. I think being unified under one flag fosters a positive environment."

(photo and excerpt used with permission from Kandis Tate)

"… This marker could get one questioning just how "historic" Christopher Columbus's voyages were…; however, there is that sect that features that strong, nationalistic ideology (which likely stems from indoctrination) that does not allow anyone to question anything about the country – they argue against anything that disparages America or shows a little bit of criticism, so then again, this marker could just reinforce those ideas."

(photos and excerpt used with permission from Jasmine Phillips)

References

Trethewey, Natasha (2010). *Beyond Katrina: A Meditation on the Mississippi Gulf Coast*. The University of Georgia Press.

It Takes a Village: Institution and Community Resources for Experiential Learning

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Author Biography

Dr. Monica Carol Miller is an assistant professor of English at Middle Georgia State University. A 2018-2019 Governor's Teaching Fellow, Dr. Miller teaches courses in professional writing, composition, and American literature. Her first book, *Being Ugly: Southern Women Writers and Social Rebellion*, was published by Louisiana State University Press in 2017. She is currently the president of the Flannery O'Connor Association

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As a part of Middle Georgia State University's growing Professional Writing program, I want to engage my students through authentic learning experiences. While I design much of the work in these courses around project-based, real-world examples, I wanted to give the students in my Advanced Professional Writing Course (PFWR 4660) a particularly authentic learning experience, one which included authentic writing projects.

We focused on the genre of the white paper: a problem/solution report. Students read the past two white papers released by the university president's office. This genre study allowed them to determine the characteristics of a white paper as well as learn more about the university. Most undergraduate students are not aware of their own institution's stated mission or long-term goals. Assigning these readings to advanced undergraduate students allowed for engaging class discussions about how the university's priorities have changed, as well as the students' perspectives on these goals.

Both white papers were solely text-based documents, so the first major assignment was to revise one of the documents with data visualizations: one graph or chart and one infographic. Infographics are becoming an important form of multimodal communication, especially in professional and technical communication; this is an important genre for students to become familiar with. This assignment provided an opportunity for both creation and analysis.

The infographic assignment was completed individually. However, since it was a small cohort of students who had experience working together, there was a significant amount of sharing of resources and knowledge. Students used a variety of products including Microsoft Word, Excel, and Canva to create their images, depending on their own experience and interests.

With this understanding of the white papers as a genre as well as practice in determining effective modes of communication, the rest of the semester was organized around a collaborative, experiential learning project with Macon's Tubman Museum as our experiential learning partner. The class researched the museum's history and the challenges it has faced. Students then drew upon project management strategies to develop a series of documents related to an issue they identified facing the Tubman Museum.

Over the course of the semester, students worked in small groups to research and identify a challenge facing the museum as well as propose a solution to this challenge. The artifacts they produced for this project included:

- SWOT Report;
- White Paper (including drafts and data visualizations);
- Identification of a possible grant to fund their proposals;

- Draft grant proposal; and
- Final presentation of their research and findings.

I credit much of the students' success not only to the authentic nature of the experiential learning assignment, but also to the group of experts on whom I called to provide their expertise to the class. To begin with, we had a session with Abbie Holmes, an instructional librarian at MGA. I often have librarians lead workshops for my students, but this session was focused specifically on their projects, including specialized database searching and resources for finding potential grants. Most of the students in the class were advanced English majors, all of whom assumed they were rather knowledgeable about academic research. It was gratifying to see how surprised they were at how much more there was for them to learn about research from Ms. Holmes; by the end of the class session, the students were exclaiming about how surprised they were at how much there was to learn.

In addition to the library workshop, we also had a class session with Barbara Ratzlaff, the Contracts and Grants Director for MGA. As many of the students had expressed interest in grant writing as a career, this session was an invaluable introduction to the surprisingly complex nature of the grant process. Ms. Ratzlaff provided students with a number of resources and models of grant writing which they found useful not only for their class projects but also in their understanding of institutional practices and effective writing.

And finally, Tubman Museum director Dr. Andy Ambrose spent a class period with the students, providing a brief history of the museum and his own involvement with the museum and discussing some of the museum's current priorities and challenges. When Dr. Ambrose visited the class, the students had all already visited the museum and done preliminary research on issues facing museums in general as well as the Tubman Museum specifically. This allowed the students to use the class time to ask focused questions about their research interests, which included accessibility, exhibit design, programming, and collection holdings.

For the final presentation day, we were joined by Ms. Holmes, Ms. Ratzlaff, Dr. Ambrose, as well as Amy Berke, chair of the English department; and Chip Rogers, director of the Professional Writing program. Students had prepared full-color copies of their white papers which included their grant proposals as appendices; on their own initiative, they had also prepared mock-ups of brochures and maps as part of their presentations. They produced professional-quality presentations and performed admirably during the question-and-answer part of the presentation, fielding questions from all who were present.

I credit quite a bit of the students' success to the generosity of my colleagues and community members, who not only took the time to visit our class but also responded to subsequent student queries as well as attended their final presentations. I learned that students took initiative to reach out to not only Dr. Ambrose but also other museums around the world to ask about their resources. Normalizing such outreach empowered students to be active agents in their work; it also provided authentic work experiences and allowed them to grow their professional networks. The fact that these professionals from the university administration and the community took the time to meet with the students and attend their presentations sent the message that they were taking the students' work seriously, which encouraged heightened student levels of engagement with their work that I rarely see. I continue to seek out new opportunities for community-based, experiential learning that will similarly engage students.

Roleplaying During Grading Conferences: Using Fictional Scenarios to Increase Student Writing Self-Efficacy

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Author Biography

Dr. Laura Davis is an Associate Professor of English and Interdisciplinary Studies at Kennesaw State University where she has taught since 2002. Her research and teaching interests include Gender and Women's Studies, online pedagogy, and literatures of the U.S. South and India. Currently, she also serves as the Assistant Chair of the Interdisciplinary Studies Department. One of her favorite responsibilities in this role is getting to mentor new teachers in both face-to-face and online classrooms.

Goal of Activity

As a composition teacher, I used to spend hours writing marginal comments telling students how to revise. However, I have come to believe that this traditional approach places students in a passive role regarding editing, and I want students to become more active writers and revisers. The activity described below was constructed with the goal of helping students gain skillful self-efficacy over their own writing and revision, gradually moving the responsibility for improvement from the professor wholly to them.

Structure of the Activity

On the first day of class I tell my freshmen that, instead of handing in four essays, they will attend four individual twenty-minute grading conferences with me and engage in a fictional role play to help them assess their own work and create a path for revision. They know they will receive rubrics ahead of time and that these conferences are intentionally scaffolded so that each one builds on the former. By the final conference they will be doing almost all their own revision and grading.

Conference one: podcast me

Students write a profile of someone, and when they come to my office I read the essay aloud to them. They must pretend they are podcast producers listening to a podcast that needs editing before it airs. As producers, on their copies they highlight anything that sounds confusing or underdeveloped as I read and note anything that sounds powerful or intriguing. When I finish, we mark the essay and rubric together. To indicate that this is a team exercise, the rubric is always visible on the desk between us, turned towards the students to encourage them to write on it. These conversations with my "producers" give me the opportunity to cover rhetorical purpose, organization, development, and language; by the end of the role-play, students are happily highlighting ways to make their "podcast" stronger through revision.

Conference two: consumer reporters

Students arrive for conference two carrying evaluative essays. Again, I read them aloud, but the role-play scenario is different; this essay requires them to evaluate a product. They must pretend they are part of a consumer satisfaction group, listening to the essay as if it they are hearing about the product for the first time. What was the product? For whom was it designed? What were its strengths? We use these questions to begin marking the paper and rubric together to determine how well they completed the task of writing a thorough evaluative essay. I score the rubric according to the strengths and weaknesses these "consumers" point out, incorporating their suggestions and mine.

Conference three: convince me

For conference three, students write proposals addressing a community problem. This time they pretend to be on a city council listening to the proposal as I read it, and as councilpersons they mark where they hear

a strong argument and where the argument is weak. Since this is the third conference, I up the ante by also asking them alone to score themselves on one or two areas on the rubric. As before, the role-playing leads to conversation about whether the student (as councilperson) was persuaded by the proposal and how the petitioner could improve the proposal the next time it comes before the council.

Conference four: curveball

The final essay is a rhetorical analysis. The students know I will already be in character when the conference begins and that they have to figure out how to play along. When students arrive, they find me sitting in the visitor seat with the black swivel chair behind my desk empty. There are no other chairs in the room. After what is often an awkward pause, I stand up and shake hands, saying, "Hello, Professor ___," (using that student's last name). "My name is [my actual first name], and I'm a student in your class. I want to read you my paper and see if you would grade it and explain how I should revise." Students' faces are usually a study in confusion at first, as it's a powerful taboo to take the professor's seat. And yet, once they do, they suddenly take on a level of utter focus. As I read "my" paper to them (really theirs), they immediately pick up their copy and start highlighting and writing on it and the rubric.

When I finish reading aloud, I say, "I just don't know where to begin revising this" to get the conversation started, and inevitably they, as "my professor," begin assisting me earnestly in strengthening "my" writing. Some of them get so involved in helping me they seem to forget it is their paper they are working so skillfully to improve. At the end of the conference, they give me a completed temporary score on all areas of the rubric just as I used to do for them.

Student feedback

At the end of the term, I ask students to write on their evaluations what they believe most improved their writing. Typically, over 90% of students choose the role-plays. They frequently comment that the conferences honed their skills as writers and revisers and grew their confidence, and they discuss a newfound self-efficacy regarding the writing they do in other classes.

These comments have convinced me that the twenty minutes I spend conferencing is far more effective than the equal time I used to spend marking each paper in isolation. Students learn through these role-plays how to listen carefully to their own words, how to improve the messages they are trying to deliver, and that they are capable of taking confident ownership over their own writing and revision. Similar conferences could be adapted for essays assigned in almost any discipline. Professors could do these conferences outside of class (as I did), using the time they formerly spent grading, or some class lessons could be moved online so that certain class days were used instead for conferences.

Team-Based Learning in Nuclear Engineering

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Author Biography

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Introduction

I began experimenting with Team-Based Learning (TBL) in 2010, and I have never seen anything like it in terms of the way it engages students in the subject. Among the students there are high fives, exclamations of joy, even hugs! I have been using it ever since. Behind this decision, the scholarship supporting my teaching approach centers on Biggs' concept of constructive alignment, consisting of carefully constructed learning outcomes, *well-designed learning activities directly addressing those outcomes*, and thoughtful assessment practices (Biggs, 1996). The learning activities for my implementation of the constructive alignment model are designed using the Team-Based Learning approach (Michaelson, Sweet, & Parmelee, 2008), and are leveraged by a variety of tools in the process education literature (Apple, Ellis, & Hintze, 2016).

Goals for my TBL Activities

I work to develop critical skills for my nuclear engineering students as learners and professionals. Specifically, I use TBL to help my students achieve learning outcomes related to becoming better engineering problem-solvers (through visualization, modeling, and reflection among other skills) and more effective team members who are valued by teammates and who communicate well. Most engineers work in professional teams, and as social beings we benefit from variety in perspective (Doolittle & Hicks, 2003). By using TBL, I can foster this in a performance-based learning environment to help students process and practice what they are learning (Michaelsen, Knight, & Fink, 2004).

Description of my TBL Activities

In my TBL classroom, students work in teams of four to seven (size depends on the course) throughout the semester. I usually assign roles for different learners to play such as captain, recorder, spokesperson, optimist, skeptic, and spy. This provides structure for each learner to contribute to the discussion and provides opportunity to practice important collaborative learning skills (Felder & Brent, 2007; Johnson, Johnson, & Smith, 2014).

Typically, students spend around 50% of class time in cooperative teams working to answer critical thinking questions; justify decisions; solve problems; and process what they are learning through compare and contrast, directed paraphrasing, or other activities. Other class time includes testing and just-in-time interactive lecture on the most challenging aspects of the material. Each day, teams open their team folder to sign in and find their assigned classwork and other materials. After completing activities, team members then indicate ways in which they contributed to the teamwork for the day.

Here are examples of typical prompts for the TBL activities in my course:

- How many fewer powerplants would be required in the US if all household room lighting were converted from compact fluorescent to LED? (a) 1 plant, (b) 10 plants, (c) 50 plants, (d) 100 plants.

- In which type of energy should the U.S. government invest most heavily in research and development over the next decade? Why? (a) clean coal, (b) nuclear, (c) solar, (d) wind, (e) other.
- Dr. Farfan does research on new detector designs in collaboration with Dr. Das. In order to help promote KSU and faculty research, they sometimes need to explain to donors or others how detectors work. Make a brief "elevator speech" to give to Dr. Farfan and Dr. Das explaining how a particular type of radiation detector works. Use at least four steps in your explanation.

Figure 1 displays the individual contributions to teamwork chart I use in my class:

Figure 1: Individual contributions to teamwork table

Team member initials						
Found data or other needed information	□	□	□	□	□	□
Offered solution method	□	□	□	□	□	□
Provided constructive criticism on solution	□	□	□	□	□	□
Performed estimates or other calculations	□	□	□	□	□	□
Offered rationale for decisions made	□	□	□	□	□	□
Other (describe)	____	____	____	____	____	____

These in-class group learning activities serve as a large part of the overall TBL learning cycle I use for my course (Michaelsen, Knight, & Fink, 2004), as shown in Figure 2.

Figure 2: TBL learning cycle

Phases of Team-Based Learning									
Activity	Preparation		Practice						Assessment
In-class		R.A.P. -Individual test -Group test -Appeals -Corrective instruction		Group Work (simple)		Group Work (harder)	Continue pattern as long as needed		Exam or other assessment
Out of class	Reading		Homework		Homework			Review	

Aproximate level of content understanding (%)			
40	50	70-80	80-100

Reflection on evidence of TBL impact towards reaching my goals for students

I collected data for three semesters in a senior level nuclear engineering course. Initial implementation involved partial adoption of the TBL process in fall of 2010 with 40 students. I next taught the course using the full TBL process in 2013 with 61 students, and again in 2014 with 28 students. I also used the full TBL approach in an introductory level course with 25 students in 2017, and with 33 students in 2018.

I measured student learning outcomes for both technical learning outcomes and professional learning outcomes through multiple types of assignments aggregated into an overall level of achievement for each outcome. Figure 3 displays results for the nine technical outcomes in the senior course. Clearly, the partial TBL implementation in 2010 was not as successful as the full TBL implementation in 2013 and 2014.

Figure 3: Technical learning outcomes

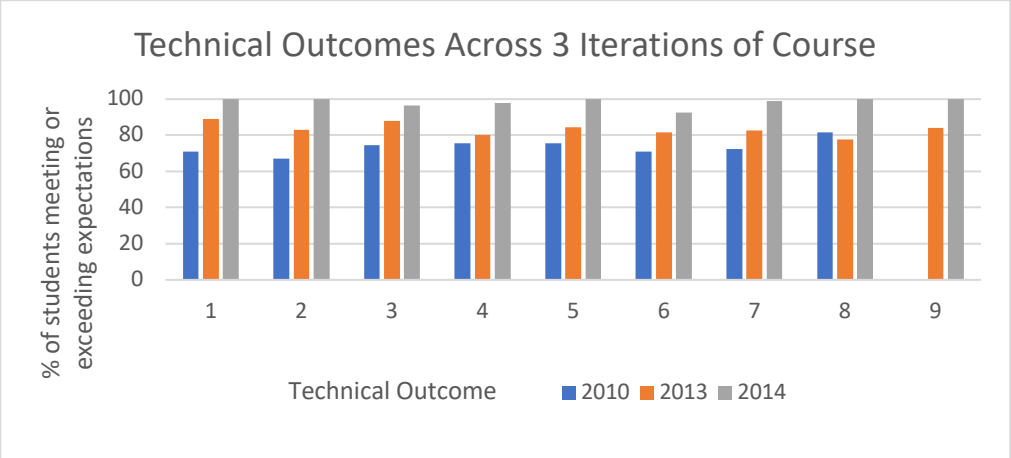
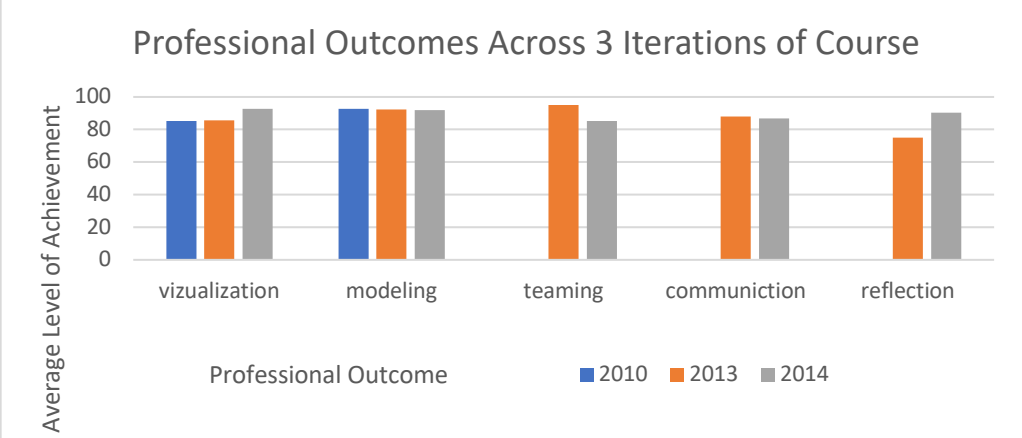


Figure 4 displays results for the senior course professional outcomes. Team skills, communication skills, and reflection skills were not measured in the first (partial) instantiation.

Figure 4: Professional learning outcomes



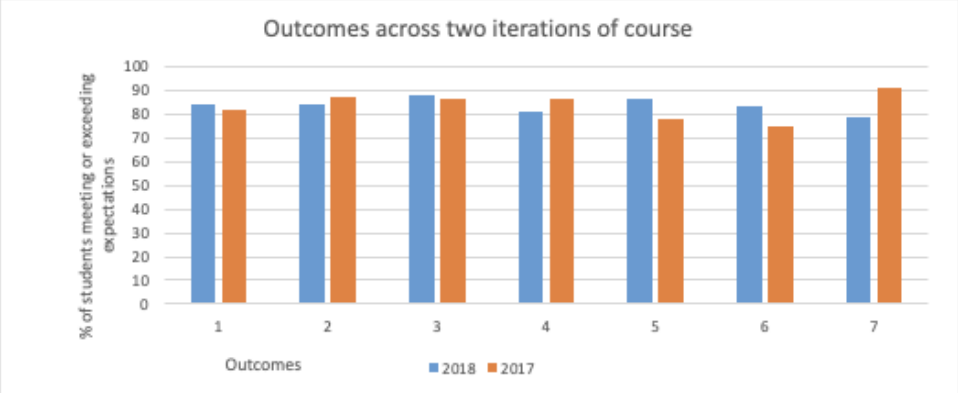
Further, DFW rates (those students who get a D, F, or withdraw from the class) dropped significantly in sections using the TBL approach when compared to all offerings of the course over the same time period, as shown in Table 1.

Table 1: DFW rates

	GPA	A%	B%	C%	D%	F%	W%
All offerings	2.56	23	33	19	15	5	5
TBL	3.31	33	41	5	2	0	3

In the introductory level courses, a similarly high level of achievement was attained, as shown in Figure 5. In 2018 one student stopped attending after the fifth week but remained enrolled. That student's data is included in the figure.

Figure 5: Professional and technical outcomes



Finally, the TBL approach provides the following general benefits:

- Promotes ABET criteria such as lifelong learning, effective teamwork, effective communication, and understanding professional and ethical responsibilities.
- Students find the course format valuable due to its parallels to real-world working environments. This is substantiated by comments from students who completed internships/co-ops.
- The use of teams can reduce grading workload.
- Student learning becomes more efficient in the TBL mode. An entire textbook chapter (requested by students at the end of the first implementation) and a team project were added to the senior course during the second and third offerings without diminishing performance on technical objectives.

For more information on TBL, visit http://www.teambasedlearning.org/.

References

Apple, D. K., Ellis, W., & Hintze, D. (2016). 25 years of Process Education. *International Journal of Process Education*, *8*(1).

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education*, *32*(3), 347–364. https://doi.org/10.1007/BF00138871

Doolittle, P. E., & Hicks, D. (2003). Constructivism as a Theoretical Foundation for the Use of Technology in Social Studies. *Theory & Research in Social Education*, *31*(1), 72–104. https://doi.org/10.1080/00933104.2003.10473216

Felder, R. M., & Brent, R. (2007). Cooperative Learning. In P. A. Mabrouk (Ed.), *Active Learning* (Vol. 970, pp. 34–53). https://doi.org/10.1021/bk-2007-0970.ch004

Johnson, D. W., Johnson, R. T., & Smith, K. A. (2014). Cooperative Learning: Improving University Instruction by Basing Practice on Validated Theory. *Journal on Excellence in College Teaching*, *25*, 85–118.

Michaelsen, L. K., Knight, A. B., & Fink, L. D. (Eds.). (2004). *Team-based learning: a transformative use of small groups in college teaching* (1. Stylus paperback edition). Sterling, Va: Stylus Publishing.

Michaelson, L. K., Sweet, M., & Parmelee, D. X. (Eds.). (2008). *Team-based learning: small-group learning's next big step*. San Francisco: Jossey-Bass.

Integrating Econometrics: A Modern Undergraduate Economics Capstone Experience

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Author Biography

Dr. Chris Clark is a Professor in the Department of Economics and Finance at Georgia College and State University. He regularly teaches core courses in economics, including principles of economics, intermediate microeconomics, and econometrics. He also teaches field courses at both the graduate and undergraduate level, including labor economics, public economics, and managerial economics. He recently developed two popular freshman-level critical thinking classes, Freakonomics and Swansonomics. Dr. Clark's research interests include education, health economics, labor economics, economic education, adolescent behavior, gambling, and public policy. His research has been published in a variety of journals including the Journal of Economic Education.

Goal of Activity

I use three specific assignments focused on learning to guide econometric students toward the successful completion of their undergraduate research project. Students begin their project in my Econometrics class and work to improve and refine their work during our Senior Seminar course. The econometrics course serves two purposes. First, it introduces students to the techniques, tools, and approaches used in modern applied economics research. Second, it allows students to begin their undergraduate research project. In the past students had trouble applying the skills they acquired in econometrics and developing research projects relevant to their interests. Therefore, we created three assignments to guide their progress: a topic memo, a data memo, and a results memo. These memos are designed to help them develop their own question, gather and clean their data, develop their programming skills, and perform their own analysis.

Topic memo

The first assignment students complete in Econometrics is a topic proposal. They are expected to present their question, explain the basic model they will employ to answer the question, provide the data sources they hope to use, and convince the econometrics and senior seminar professors their topic is interesting/important enough to warrant the student's attention. This memo is due early in the semester, typically during the first month, to emphasize to students the importance of their projects. I find students do a relatively poor job when they are not personally invested in the topic, so I push them to develop their own questions, suggesting refinements when necessary. In my experience, students who feel personally invested in their project perform better and gain considerable confidence when sharing their findings with others.

Data memo

The second assignment students will complete in Econometrics is a data memo. At this point students begin to become familiar with the statistical software most commonly used by Economists. It is also the point at which they learn the importance of critically evaluating the source and quality of data. These are skills economics graduates must have if they wish to be successful in graduate school and/or when they begin their careers. I carefully walk students through the process of acquiring, cleaning, and verifying data, but they are expected to apply what they've learned to their own work.

Results memo

The final assignment students complete in Econometrics is their results memo. They are presenting their first attempt at answering their question, so they know they will be expected to harshly evaluate their own work and present a game plan for future improvements. If their model suffers from any econometric issues,

and they always do, I expect the student to explain how they will address them moving forward. I also expect the student to provide a correctly specified model and carefully explain their identification strategy.

These three memos are evaluated based on detailed rubrics student receive at the beginning of the course. They are graded on the quality of their writing, the quality of their analysis, and the way in which they present and explain their research. Students are expected to take the three assignments they completed in my econometrics course, and the feedback they've received, and use those to synthesize a completed research paper and presentation during their senior seminar course.

A more detailed description of this undergraduate research program is available in the article "Integrating Econometrics: A Modern Undergraduate Economics Capstone Experience", which my colleagues (Brooke Conaway, JJ Arias, and Jessie Folk) and I published in the *Journal of Economic Education* in 2018. We published this article because this integrated approach is uncommon in the economics discipline. We felt it would be worthwhile to share our innovative approach in order to help other faculty interested in undergraduate research develop their own version. Since adopting this approach our students have received several awards for outstanding undergraduate research at the Academy of Economics and Finance conference, with one student receiving the Frank W. Taussig Award from Omicron Delta Epsilon.

Many of our strongest seniors are particularly interested in graduate school. Some of those students choose to enter Master's program and some select PhD programs. One of the reasons we made these changes to our program was to increase student preparation for and interest in PhD programs. Comparing the five years before and after our adoption of this new approach, we find the percentage of students attending graduate school who chose to pursue a PhD increased from 60% to 88%.

We also adopted this approach to encourage students to ask interesting questions that they are passionate about. The following five questions are examples of the kinds of questions our students have been asking:

Does PTSD affect employment?
Does police militarization affect civilian deaths?
Do different races perceive their financial success differently?
Does legalizing same-sex marriage affect hate crime rates?
Does repeating or skipping a grade affect self-assessed intelligence?

These are challenging questions, both from a societal point of view and econometrically. Our students have used some fairly complex econometric techniques to answer them. A recent example features a student using an ordered probit technique with properly interpreted marginal effect estimates to address the question "Does repeating or skipping a grade affect self-assessed intelligence?" Another student utilized a difference-in-difference technique that exploited the variation in same-sex marriage law across states and over time to address the question "Does legalizing same-sex marriage affect hate crime rates?"

We feel our students are gaining realistic, practical experience using modern econometric techniques to answer important questions. This prepares them for graduate school and careers utilizing data. As we wrote in the paper we published summarizing our approach: "We feel this integrated pedagogical approach to student research in economics is a more effective way to help students learn and prepare for the future."

References

Conaway, B., Clark, C., Arias, J. J., & Folk, J. (2018) *Integrating econometrics: A modern undergraduate economics capstone experience.* The Journal of Economic Education, 49:3, 260-270, DOI: 10.1080/00220485.2018.1464986

Analogy-Enhanced Pedagogy: Class Activities to Engage Students in Learning

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Joseph A. Mayo, Ed.D., is a Professor of Psychology at Gordon State College in Barnesville, Georgia, who has been teaching and conducting classroom-centered research in higher education for over three decades. His primary research interest is effective undergraduate teaching strategies with an emphasis on constructivist classroom applications. He is the recipient of both statewide and national awards for his teaching innovations and ongoing contributions to the scholarship of teaching and learning.

Theoretical and Empirical Background

Analogies provide an interpretive bridge in comparing features of familiar and unfamiliar concepts. As such, they serve a conduit function in allowing us to arrive at hybrid conceptualizations that invoke shared similarities between old and new understandings.

Classroom research on successes of analogical reasoning has focused heavily on analogies created by teachers and textbook authors for introducing new concepts. To counterbalance that, I have spent the past two decades systematically investigating the impact that *student-generated* analogies have on learning within my own undergraduate psychology classes (Mayo, 2001, 2006, 2010, 2019). Overall, I have found students' learning gains most striking when they create their own analogies through classroom activities affording opportunities for facilitating student-to-student and instructor-to-student interactions.

Analogy-Enhanced Learning Activities

My findings in favor of what I call *analogy co-construction* form the basis for the following whole-class activities that I have arranged in ascending order of task complexity. Accompanying a brief description of each activity, I have either included an example from my own teaching or an illustration of how that activity might be used to aid learning in other academic disciplines. As springboards for student engagement, the first activity uses a simple physical prop, whereas the remaining activities proceed in absence of tangible objects.

Object association

Hold up an object in class and ask students to think of ways that the object is both similar and dissimilar to a given concept.

Example. The undergirding role of analogies is to structurally align similar components of familiar and unfamiliar conceptions. However, allowing students to actively explore dissimilarities makes them aware that even well-conceived analogies break down somewhere. To demonstrate, in teaching the concept of *tabula rasa* ("blank slate") to my life-span development students, I manipulate an etch-a-sketch screen in front of the class in anticipation that students will come to view my actions as symbolic of the way that life experiences "compose" a person's developmental history. Unlike the etch-a-sketch that can be shaken clean at will, however, students typically reason that both affirming and detrimental effects of life experiences are cumulative in determining the course of development.

Fill in the blank

Offer a partial analogy to the class. Afterward, permit students the chance to complete the blank.

Example. Identifying when one concept is like another epitomizes analogical reasoning. For example, in teaching a cell's organizational boundaries in an introductory science class, a teacher might tender the partial analogy: A cell membrane is like _____. If a student responds "an Oreo cookie," the instructor might then ask, "Why?" A viable answer might be that a cell membrane is like the phospholipid bilayer of an Oreo cookie with cholesterol as the cream filling (Glynn, 1991). Again, be sure to encourage students to uncover where the *analog* (Oreo cookie) evidences dissimilarities from the *target* (cell membrane).

Word association

Present the class with a term. Next, ask students to generate and justify other words that they associate with this term.

Example. In this approach, students rely on concepts that they already understand (familiar) to clarify those that they do not yet comprehend (unfamiliar). To exemplify, *stream of consciousness* is a term with teaching implications across disciplines, including psychology, speech communication, and journalism. As originally conceived (James, 1890/1950), this metaphorical expression highlights that human consciousness occurs around the clock, even in altered states such as daydreaming, sleeping, and dreaming. In the framework of a word-association task, students might submit stream-related words (e.g., flow, unending, unbroken) in capturing the essence of this conception.

Contextualizing learning

Using the name of a well-known person relevant to course content, ask students to imagine that they actually *are* that person in the conduct of his or her work. Probe students on how they might feel being that person relative to this work.

Example. Consistent with bridging capabilities of analogical thinking, contextualizing learning occurs when students process new information by making personalized sense of it in a particular context (e.g., from another's perspective or experiences). One way to accomplish this goal is for teachers in any academic discipline to ask students to "put themselves in the shoes" of famous contributors whose work they plan to cover. Before discussing a groundbreaking theory in a physics class, for instance, a teacher might pose the following question to the class: "If you were Albert Einstein, how would you feel about working on the theory of relativity?" Careful consideration in answering might help students to contextualize their understanding of Einstein's work, based on personal and sociohistorical overtones occurring during the time that he proposed this theory. I have found that preceding this activity with a mini-biographical sketch of the contributor's life and times increases likelihood of success.

Student Feedback

At the conclusion of class in which I have used one of these activities, I assess students' perceptions of completing that activity with an anonymous 5-item questionnaire with rating anchors at 1 (*not effective*) and 5 (*highly effective*): (1) stimulating engagement in learning; (2) facilitating understanding of course content; (3) increasing motivation to learn; (4) promoting intellectual challenge; and (5) fostering interest in the subject matter. Students' numerical ratings have been routinely positive in the 4-5 range on all surveyed items.

The questionnaire also includes an open-ended section marked *Comments* where students are invited to respond narratively, as in this actual student excerpt: "Even though I already had a basic idea of what *tabula rasa* was before today's class, using the etch-a-sketch to discuss it was a great way to bring it to life."

Despite the global success of these activities, one criticism voiced periodically by students is that even though analogies can be helpful, they can also be confusing and misleading if pushed to an unsubstantiated extreme. As a proactive measure to address this legitimate concern, it is important that teachers urge students to discover where analogies fall short in terms of dissimilarities between familiar and unfamiliar conceptions (Glynn, Law, & Doster, 1998).

References

Glynn, S. M. (1991). Explaining science concepts: A Teaching-with-Analogies Model. In S. M. Glynn, R. H. Yeany, & B. K. Britton (Eds.), *The psychology of learning science* (pp. 219-240). Hillsdale, NJ: Erlbaum.

Glynn, S. M., Law, M., & Doster, E. C. (1998). Making text meaningful: The role of analogies. In C. R. Hynd (Ed.), *Learning from text across conceptual domains* (pp. 193-208). Mahwah, NJ: Erlbaum.

James, W. (1950). *The principles of psychology*. New York: Dover. (Original work published 1890).

Mayo, J. A. (2001). Using analogies to teach conceptual applications of developmental theories. *Journal of Constructivist Psychology*, *14*, 187-213.

Mayo, J. A. (2006). Reflective pedagogy through analogy construction. *Southeastern Journal of Psychology*, *1*, 1-6.

Mayo, J. A. (2010). *Constructing undergraduate psychology curricula: Promoting authentic learning and assessment in the teaching of psychology*. Washington, DC: American Psychological Association.

Mayo, J. A. (2019). Analogy co-construction as a pedagogical strategy in life-span developmental psychology. *Journal of Teaching Action Research*.

Increasing Relevancy and Learning through Audio-Visual Content Acquisition Podcasts

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Dr. Katherine (Katy) Green is an associate professor and program coordinator of Special Education at the University of West Georgia. She graduated from Georgia State University with a Ph.D. in the Education of Students with Exceptionalities with a focus on children with disabilities ages birth to five. With degrees in Speech-Language Pathology and Special Education, Katy taught young children with disabilities in public schools for eight years. Katy's passion and expertise include social-emotional, early communication, and academic supports for young children with disabilities and their families.

Goal of Activity

The goal of Content Acquisition Podcasts (CAPs) is to provide relevant and alternative means of instruction, while using a multi-media platform. CAPs can be used by instructors to deliver instruction (e.g., Kennedy, Kellems, Thomas, & Newton, 2015), but CAPs can also be created by college students to present knowledge acquired (e.g., Green, Stuckey, Towson, Robbins, & Bucholz, 2019; Alves et al., 2018). Student-created CAPs will be the focus of this manuscript, as discussed below.

In my former undergraduate courses, I often had students research a topic and present the topic to the class at the end of the semester. However, I noticed that students did not always attend to each other's presentations. Further, not all students put their best effort into the presentation. Thus, I decided to require students to make a permanent product: a content acquisition podcast (CAP) rather than a live classroom presentation. The CAPs could then be shared with interested individuals outside the classroom, given student permission. The hypothesis was that if students made a permanent product while using current technology, the assignment may be more meaningful and engaging. Additionally, instead of watching live student presentations, CAPs may increase attention and engagement as the CAPs are similar to short videos that students may find of interest on YouTube or other media sites.

Description of the Activity

CAPs are short, audio and visual podcasts that can deliver instruction in any content area. CAPs are typically created using still images with recorded narration (Kennedy, Hart, & Kellems, 2011). Unlike traditional podcasts, which are usually published online as a series and made available for downloading, CAPs are often stand-alone files, created by educators for instructional purposes. CAPs were designed based on Mayer's cognitive theory of multimedia learning (Mayer, 2009) and 12 accompanying evidence-based instructional design principles (Mayer 2008). The literature on CAPs is relatively new and the majority of research is currently conducted in teacher preparation programs. However, CAPs can be used in any discipline.

Before making the CAP, the students should determine one specific topic. Students may choose their topics or the instructor may assign topics. For example, I have used CAPs in an introduction to special education course. The students made a CAP on a self-selected disability category, such as autism. I have also used CAPs in a math methods teacher preparation course, and the students made the CAP on an assigned mathematics instructional strategy. In an English Literature class, students made a CAP on a particular book or author.

CAPs are often made using slide show software, such as Google Slides or PowerPoint. Prior to creating the CAP, students should be introduced to Mayer's cognitive theory of multimedia learning (Mayer, 2009) and the twelve accompanying evidence-based instructional design principles (Mayer 2008). Students start their CAP with an introductory and agenda slide. The CAP should then have a body of text and a conclusion slide. The students use more images than text in creating the slides; students narrate over the slides, so text should be at a minimum. The text and images should be close together on the slide. I required the maximum length of the CAP to be 5-8 minutes long. The specified length requires the student to select only the most important concepts in the CAPs. Finally, students may use a movie software, narration software, or screencast software to finalize the CAP. Students are recommended to practice narrating the CAP several times in order to create the optimal final product. (See Table 1 on how to make a CAP). To ensure accessibility by all students, the CAPs should be narrated properly, as well include an accompanying transcript of the narration.

Reflection of How the Activity Meets the Author's Goal

I have used CAPs in a variety of undergraduate hybrid and face-to-face classes. When first presented with the activity of student-created CAPs, anecdotal evidence revealed the undergraduate students expressed concern, fear, and intimidation of creating an unfamiliar multimedia product. However, after they created and watched the CAPs, the students reported that they preferred the CAPs over the typical classroom presentation. When requiring teacher candidates to create CAPs on math strategies, the teacher candidates expressed plans to create CAPs for their K-12 students to help them understand how to complete complex math problems.

The author of this article recently completed a study (Green et al., 2019) comparing student-created CAPs to live student presentations. This study investigated student-created CAPs to demonstrate understanding of math strategies for working with children with disabilities in *Math Methods for Teaching Students with Exceptionalities* course. The research question investigated the effects of the CAP condition, compared to the live presentation condition, on student knowledge of math strategies. An experimental group design was used to compare the two conditions. Results from the study indicated that teacher candidates, when given the opportunity to create a CAP, gained a significant greater depth of knowledge than the groups that created live classroom presentations on math strategies. There is a developing body of research to review studies on CAPs (e.g., Alves et al., 2017; Kennedy et al., 2015).

References

Alves, K. D., Kennedy, M. J., Kellems, R. O., Wexler, J., Rodgers, W. J., Romig, J. E., & Peeples, K. N. (2017). Improving preservice teacher vocabulary instruction: A randomized controlled trial. *Teacher Education and Special Education, 41*(4), 340-356. doi:10.1177/0888406417727044

Green, K. B., Stuckey, A.S., Towson, J. A., Robbins, S. H., & Bucholz, J. (2019). The effects of content acquisition podcasts on mathematics disability strategy knowledge of preservice special education teachers. *Journal of Special Education Technology.*

Kennedy, M. J., Hart, J. E., & Kellems, R. O. (2011). Using enhanced podcasts to augment limited instructional time in teacher preparation. *Teacher Education and Special Education, 34,* 87–105.

Kennedy, M. J., Kellems, R. O., Thomas, C. N., & Newton, J. R. (2015). Using content acquisition podcasts to deliver core content to preservice teacher candidates. *Intervention in School and Clinic, 50,* 163–168.

Kennedy, M. J., & Thomas, C. N. (2012). Effects of content acquisition podcasts to develop preservice teachers' knowledge of positive behavioral interventions and supports. *Exceptionality*, *20*(1), 1-19.

Mayer, R. E. (2009). Multimedia learning (2nd ed.). New York, NY: Cambridge University Press.

Mayer, R. E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American psychologist*, *63*(8), 760.

Additional resource on creating CAPs: https://tedcec.org/wpcontent/uploads/2018/09/Content_Acquisition_Podcasts.pdf

Table 1
Instructions of how to make a CAP

Step One:

- Identify a topic.
- Decide the most important information.
- Your CAP should be clear, concise, and organized.

Step Two:

- Title your presentation with a title that clearly explains what the CAP is about.
- Organize your content and separate out the key points. Use key points as slide headings.
- Use bullet points for the supporting details.
- You will narrate your CAP; eliminate any unnecessary information.
- Add speaker notes to your PowerPoint, and print them for your narration later.

Step Three:

- Replace text heavy slides with pictures that represent the content.
- Make presentations visually appealing to keep the audience engaged.
- Choose a word or short phrase that describes the topic of the slide.
- Use large text and text color that is easily readable over the background you choose.
- Locate your text in the middle of the slide or near a key picture.

Step Four:

- Finalize your presentation, and type a script of what you're going to say.
- Review your PowerPoint; make sure that it is clear and easily understandable.
- Rehearse your presentation until you are comfortable and CONFIDENT!
- Record and publish your CAP.

How to Publish your CAP using a Screencast Program:

- Create a presentation using software, such as PowerPoint or Google Slides.
- Use a screencast program (e.g., Camtasia, Screencast-O-Matic) to narrate your PowerPoint.
- Publish your program. You can upload to a file sharing site such as Vimeo or YouTube.
- Use the videos linked here to help you make a screencast for either your Mac or PC:
- Video Tutorial: How to record a screencast on Windows 10 for free https://www.youtube.com/watch?v=7QQOGLYhRdo
- Video Tutorial: How to make a screencast on a Mac https://www.youtube.com/watch?v=2qkHq4gDnE4

Flippin' Engineering Mechanics! Observations of Student Achievement and Engagement

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Author Biography

Donald Webster joined the faculty at the Georgia Institute of Technology in 1997 and is currently the Karen & John Huff School Chair and Professor in the School of Civil & Environmental Engineering. Dr. Webster's research expertise lies in environmental fluid mechanics focused on the influence of fluid motion and turbulence on biological systems. Dr. Webster is a Sustaining Fellow of the Association for the Sciences of Limnology and Oceanography and has won numerous awards including the Class of 1934 Outstanding Innovative Use of Education Technology Award, the Eichholz Faculty Teaching Award, and the British Petroleum Junior Faculty Teaching Excellence Award.

Goal of Activity

The goal of this activity is to improve learning outcomes for core undergraduate engineering mechanics students by transforming the classroom experience from a traditional modeling-and-mimicry pedagogy into an active and engaging learning environment. But, what do "active" and "engaging" mean? Chi and Wylie (2014) developed a taxonomy for learning engagements. In this framework, the categories of engagement describe observable behaviors in students. Interactive (I) engagement occurs when two students engage in constructive dialogue around a product, in which turn-taking is evenly distributed; constructive (C) engagement occurs when students generate or produce an output of some kind; active (A) engagement occurs when students exhibit some kind of motor movement or physical manipulation; and Passive (P) engagement occurs when students receive information without doing anything beyond listening. Chi and her colleagues believe that these categories not only demonstrate a spectrum of learning modes but also form a hierarchy of learning achievement from minimal understanding (P), to deep understanding (I) because higher levels of student engagement correlate with higher levels of student outcomes. The framework is typically referred to as ICAP, an acronym consisting of a letter for each level of engagement and achievement in descending order.

A common (or "traditional") engineering mechanics lecture course format typically can be described as active (A) in that students are taking notes and participating in discussion. Further, students often have constructive assignments outside of the classroom consisting of problem-solving exercises. The challenge is to see whether such a course can be transformed into an interactive (I) learning environment, one that elevates student engagement and achievement.

Description of the Activity

The pedagogy described here has been implemented in a series of engineering mechanics courses, including Engineering Dynamics and Fluid Mechanics. These courses are considered foundational subjects in most undergraduate engineering curricula. They are rigorous and challenging courses that blend fundamental physical principles, applied calculus, material properties, and other technical subjects to address engineering applications.

By employing strategic technological elements in the course design, an interactive learning environment can be created. The approach follows what typically is referred to as a blended or "flipped" classroom. As described below, this pedagogical approach requires a significant shift in the roles and activities of the students and instructor.

Prior to arriving for the classroom session, students watch online video lectures that consist of short (10 minute) introductions to the content and sample problem-solving exercises. During the classroom session, students are given problem-solving exercises on the daily subject. The instructor often starts one exercise on the board and then releases the students to work in teams of two to complete a series of exercises of increasing difficulty. The instructor and assistants roam the room talking to the student teams and answering questions. The interactive nature of the classroom comes through the communication and negotiation within the student pairs and with the instructors. The team size of two students was selected in order to facilitate the conversations. Students do not receive credit for successfully completing the problems beyond credit for attendance and participation, a decision that has the net effect of focusing the students' attention on learning rather than completing the assignment. The instructor's handwritten solutions are posted after class on the course website, so the students can "close the loop" on aspects that remain unclear to them.

Students are given weekly online quizzes that assess their achievement of the learning objectives of the weekly content. The online system generates unique input parameters for each individual student so that no two students have the same numeric answer. Students receive immediate feedback on the correctness of their submissions, and they can receive credit for any of three attempted submissions. After submitting either the correct answer or the third incorrect answer, students gain access to the handwritten problem solution (and cannot submit additional answers for credit). The instructor and assistants are available for in-person or online "office hours" help in the period leading up the quiz submission deadline. On roughly a four-week cycle, exams are given (in class) that consist of hand-written problem-solving exercises. A comprehensive final exam is given at the end of the semester, again consisting of problem-solving exercises. The instructor manually grades all exams to assess student achievement of the problem-solving skills and other learning outcomes.

Reflection on How This Activity Meets the Author's Goal

The instructor was highly motivated to assess the effectiveness of the pedagogy and collected significant data to quantify student achievement, engagement, and perceptions. These data include mid-semester opinion surveys, end-of-semester standardized course and instructor opinion surveys, pre-semester and post-semester concept inventory exams, standardized engagement surveys, and exam scores.

In all cases, course assessment reveals significant gains in student achievement, engagement, and perceptions in the blended classroom format. Specific comparisons conducted include 1) a comparison of parallel offerings of a traditional section and a blended section during the same semester (with common exams); 2) a comprehensive longitudinal comparison of student achievement and perceptions over a 15-year period in classes taught by the same instructor in both course formats; and 3) a comparison of a relatively small blended section with 37 students to a much larger blended section of 82 students (with the same instructor).

The results of these studies are remarkable. Students universally reached higher achievement of the learning outcomes in the blended classroom in the parallel-section study as well as in the multi-year comparison with the same instructor. Student surveys reveal significantly greater enthusiasm, stimulation, self-perception of how-much-learned, perception of the value of the course activities, and the overall effectiveness of the course and instructor in the blended classroom format. The blended classroom format also yielded a significantly lower withdrawal/failure/deficient (WFD) rate, indicating that struggling students are more able to remain in the course and achieve success. Students in the larger blended class performed as well as, or better than, students in the much smaller blended section. They also showed a similar level of engagement and a similar, or even more positive, perception of the course effectiveness in the larger blended section, indicating that the course format defies conventional wisdom about declining engagement and satisfaction with increasing class size. In summary, the blended-classroom approach can be remarkably effective in notoriously challenging engineering mechanics courses.

References

Chi, M. T. H. & Wylie, R. (2014). "The ICAP framework: Linking cognitive engagement to active learning outcomes." Educational Psychologist, 49: 219-243.

Level Up: Using Digital Badges and Gamification Strategies to Increase Student Engagement and Achievement

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Author Biography

Dr. Neil Rigole has decades worth of instructional technology, online learning, and information technology experience teaching and leading initiatives and programs in higher-ed, K12, and adult/technical education. He is currently an Associate Professor in the School of Computing at Middle Georgia State University where he is the Coordinator for the Masters of Science in Information Technology program. He has also been named a USG Chancellor's Learning Scholar for the 2019/2020 academic year.

Introduction

Motivation is a key factor behind what drives a person to complete an activity, whether that motivation is intrinsic or extrinsic. Digital badges can serve as motivators and they are being utilized by a variety of social media, entertainment, educational platforms, and health activity trackers to reward the user for their achievements and involvement in an activity. They are useful in not only helping to motivate a learner, but can also promote an atmosphere of valued learning. Digital badges can also be a way for the learner to showcase their skills and achievements while also encouraging the learner to gain more knowledge as they advance forward in the learning process. Digital badges and gamification strategies can be integrated into coursework to ensure enhanced engagement and motivation to increase student learning and achievement in online and traditional face-to-face learning environments.

Structure of the Activity

For my classes in Interactive Digital Media, digital badges are awarded through the D2L Brightspace Learning Management System for project-based assignments (not for assignments such as quizzes or traditional discussion posts). The badges were created through the Digital Badge Designer (http://openbadges.me), which is accessible via Brightspace as well as with Adobe Photoshop. Each badge represents a significant milestone for the course in projects related to the course content.

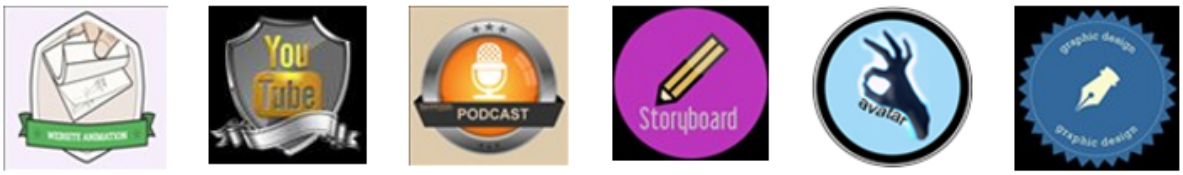

Figure 1: Examples of Project Badges

I also provide a total of six "Level Up!" badge opportunities with each counting as an additional point added to the student's final grade (for a possible additional six points). Together, these six "Level Ups!" theoretically may allow a student to move up one letter grade (i.e. B to an A, or C to a B).

Figure 2: Examples of Level-Up Badges

The badges are awarded manually after successfully completing a designated assignment. While all of the "Level Ups" are optional and voluntary, the other badges incorporated into the course are considered additional "rewards" for obtaining an excellent grade (80% or above) on one of the seminal projects for the course. By awarding both optional and non-optional badges, all students in my course can earn badges and take part in the "gamification" of the course. The gamification strategies employed include the use of a "leaderboard" which identify the top badge earners in each section, as well as the addition of the "Level Up!" badges that allow students to earn extra credit on their final grade for the course. A leaderboard is posted on the course homepage that shows the top badge earners for a given week.

Student Results and Feedback

In the initial pilot of these strategies, 35% of the students increased their achievement in the course, with achievement being defined by the individual student's end of course grade. It is interesting to note that the majority of the students with a grade change (19%) moved from a B to an A, yet two students were able to increase a D to a C and one student managed to earn a passing grade of D from an F. Other results include:

- Increased participation in course activities, which is a sign of increased engagement.
- Improved success rates and overall grade average for the classes.
- Positive student responses that show it made their course experience more enjoyable. As one student noted when a badge was received:

Other responses include:

> *This is one of the best classes I have taken so far. I LOVE the software I downloaded, and I whiz around doing stuff I never thought I could do with animation, pictures, videos and presentations. Professor Rigole explains everything thoroughly and makes the class interesting with badges and extra credit.*
>
> *Absolutely loved this class. It has been very fun and taught me a lot about an interesting field I would have never known about otherwise.*
>
> *I love it when instructors give me something fun, interesting, and unique as an assignment. Your assignments were engaging and dynamic. I really hate doing the typical essay (not every student is a gifted writer) so being able to create something as an assignment is a welcome change.*
>
> *I love how all of my assignments receive a personalized review, I love how you know just the right amount of work to issue and I love how your assignments are unique.*

There is a need for methods and technology in our courses to further motivate our learners, as these students are technology savvy and expect to be engaged. Incorporating gamification strategies such as digital badges can engage and motivate our students, which can increase student learning and achievement while also supporting retention, progression and increased graduation rates.

Peer Instructional Review Sessions

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Author Biography

Dr. Binh Tran is an Assistant professor of Information Technology in the School of Science and Technology at Georgia Gwinnett College (GGC). At GGC, he teaches courses in computing, information systems, computer networking, advanced networks, systems administration and cloud technologies. He believes that as a professor it is his duty to not only teach students the material concepts and progress them through their course of study, but to develop them to become professionals and prepare them for acquiring that first job in the field through continuous mentorship. He embeds industry certifications, resume review, interview preparation and career advice into all his courses readying students for industry success.

Goal of Activity

The goal of the peer instructional review session is to allow students to prepare for a midterm exam or final exam with a strategy designed to enhance learning and information retention (Koh, Lee, & Lim, 2018). The concepts that the students retain are intended to be used in future coursework and to add to their overall knowledge base. The underlying premise of this approach is that by using the active learning strategy of teaching others, the peer instructors will retain more of the information.

Description of the Activity

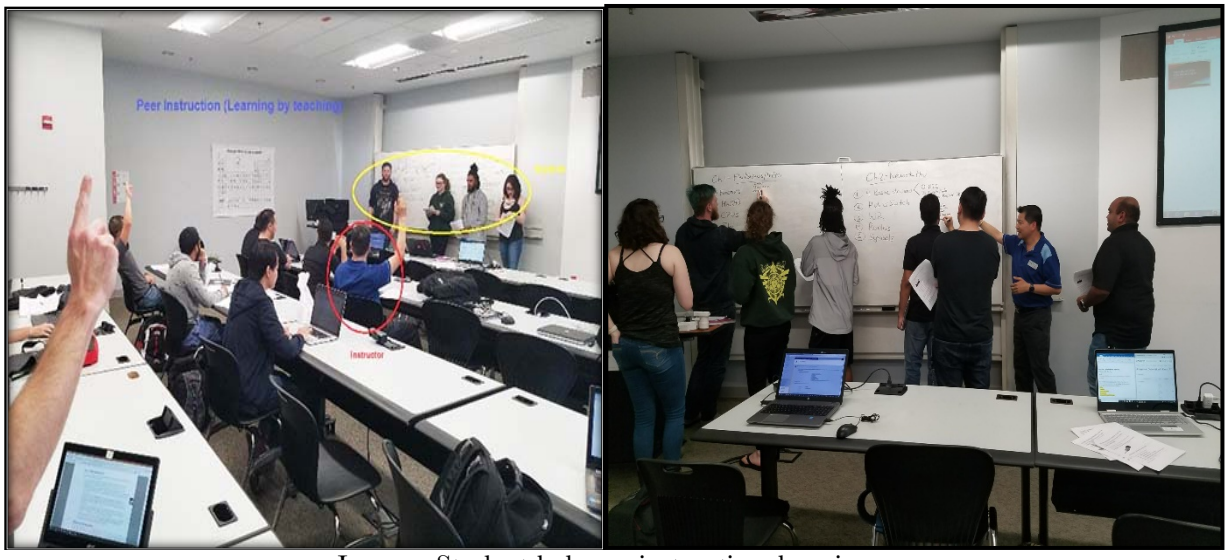
Prior to a midterm or final exam, students are divided into groups of three or four. Each group is assigned one or two chapters which they will master and teach to the rest of the class. Groups must be prepared to answer questions from their peers and the instructor regarding their assigned chapters. Depending on the nature of the class and the chapter topics, a brief outline is provided by the instructor to the student groups to serve as a guide for their preparation. Students are given an appropriate time frame—normally a few days—to prepare and either meet outside of the normal class period to practice their final presentation, or during class if it coincides with a face-to-face meeting of a hybrid class.

During the peer instructional review session, each group has about fifteen to twenty minutes to present the chapter content and highlight the most important concepts to their peers. There is a five to ten-minute question and answer session where students can ask the peer instructors questions. The instructor ensures that all important concepts are covered by asking additional questions of the peer instructors. Students then rate their peer instructors as a group on their overall performance as a graded assignment. In turn, the next group gives their presentation and the process continues until all groups and all content chapters have been presented.

Reflection of the Activity

The activity requires students to prepare and know the content well enough to be able to teach the concepts and to answer questions, allowing the peer instructors to better retain those concepts. It enables the students and the peer instructors to see potential areas that need further clarification, allowing them to focus their studies on the areas specific to their levels of understanding.

The instructor may also identify areas where the students lack full understanding and can modify their teaching methods in the future. For example, the instructor can create other active learning assignments and labs to address common learning gaps highlighted by this activity.



Images: Student-led peer instructional sessions.

Student Feedback

I found the Peer Instructional Session super useful and only had to do minimal studying to do well on the exam because I know what areas to focus on.

Peer pressure forced me to really prepare and know the material since I did not want to be embarrassed by my classmates or the professor.

Only after doing the exercise did I see that teaching is a difficult task. I had no idea of all the prep work that was required to teach effectively until I had to prepare and I was only responsible for 1 chapter!

Initially I did not like the assignment because I am not a good public speaker but that forced me to really know the material to be able to present it helping me retain it for the exam.

The session felt like an informal group study session and I found out clearly what I needed to focus my studies on.

During the exam when the concepts were tested, I realized I recalled them from the peer instructional session especially those that I presented with ease.

I still remember concepts from the chapter that I presented that I used in a later class over a year after giving this session.

Conclusion

As the student feedback suggests, students find that the peer-instruction process makes their studying much more interactive, resulting in better retention of the concepts presented. The activity forces students to take control of their own learning instead of being passive learners and leaving it up to the instructor to do most of the work.

Data from several semesters over several years in an upper level Information Technology course has shown that the midterm exam score averages are approximately 10-15% higher than when presented in the more passive approach.

Many students, even after several semesters, still remember the chapters they were responsible for teaching. This approach may lead to long-term conceptual recollection which is part of the author's goal of the activity for more permanent knowledge retention.

References

Koh, A. W. L., Lee, S. C., & Lim, S. W. H. (2018). The learning benefits of teaching: A retrieval practice hypothesis. Applied Cognitive Psychology, 32(3), 401–410. https://doi.org/10.1002/acp.3410

Creating Cadence: Fostering Persistent Engagement in Asynchronous Online Courses

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Author Biography

David Joyner is a Senior Research Associate and the Associate Director for Student Experience in Georgia Tech's College of Computing, focusing on its online programs. Since starting as a faculty member after completing his PhD, he has taught 37 online classes across 13 semesters with a total enrollment of over 11,000. For his efforts, he has won the USG Board of Regents' Teaching Excellence Award for Online Teaching, the Georgia Tech Curriculum Innovation Award, the Georgia Tech College of Computing Dean's Award, and the Georgia Tech Lockheed Excellence in Teaching Award.

Introduction

The current boon of affordable, scalable online degrees is supported by the modern internet as a medium to construct high-quality, fully asynchronous learning experiences. The asynchronous nature of these programs accommodates working professionals who are unable to carve out consistent and prescribed times for the pursuit of a degree, but who nonetheless have the dedication and ability to succeed at the programs' content.

However, these classes' asynchronous nature breaks some of students' assumptions about the structure of college courses. Scheduled meetings do more than just support disseminating lecture material or facilitating synchronous activities; they establish a classroom cadence and set students' expectations for the pace and routine of the course. Without meetings, these expectations are lost. Moreover, the persistent availability of asynchronous material removes scarcity from the experience, and while this is one of the medium's strengths, it may also lure students into unhealthy procrastination.

Thus, asynchronous online classes must actively accomplish that which traditional classes accomplish passively through required lecture attendance: creating cadence and incentivizing persistent engagement.

Creating Cadence & Incentivizing Engagement

Recreating cadence for the online environment requires first, creating a consistent temporal structure to a class; and second, communicating that structure to students. Synchronous classes have an implicit structure in their lecture meeting times; students generally expect assignments, readings, and other material to follow that schedule. Online, no such unit of time exists, and so one must be established.

We recommend taking as a minimum unit of time one class-week; this means setting assignment deadlines at the same time each week, attaching lecture and reading tasks to individual weeks rather than days (too specific) or sections of material (too general), and targeting an even distribution of work across the multiple weeks of the semester.

Figure 1, below, shows an excerpt of the full course calendar of a class constructed according to this philosophy. Each week of the term has multiple associated tasks, each with an expected time to complete that task. For this class, expected time allotments add up to 10 hours for every week, indicating that the workload is evenly distributed. Assignment deadlines are each Sunday at midnight, which establishes in students the expectation that they need only look forward toward the next Sunday; they need not worry about overlooking a mid-week deadline. They are free to determine when during the week they may find 10 hours to pursue their coursework.

Week	Tasks	Deliverables	Deadline
1	• Read through all course documentation (1) • Introduce yourself on Piazza and greet your classmates (1) • Complete the start-of-course survey (0.5) • Watch lessons 1.1, 1.2, and 1.3 (1.5) • Complete this week's required readings (1.5) • Interact with your classmates on Piazza (1.5) • Complete the peer review activity (0.5) • Begin CITI Training (2.5)	• Introduction Piazza Post • Start-of-Course Survey	01/13/2019
2	• Watch lessons 2.1 and 2.2 (1.5) • Complete Assignment P1 (2.5) • Continue CITI Training (2) • Complete this week's required readings (1.5) • Earn participation credit (extra peer reviews, Piazza posts, project participation) (1) • Begin Project P (1.5)	• Assignment P1	01/20/2019

Figure 1: A section of a full course calendar from a class designed with this cadence-creating paradigm in mind.

It is important to note that this structure is about more than merely having a synchronous schedule. A class structure that scattered deadlines throughout the semester without a clear structure, including mid-week deadlines and varying feedback turnaround times, would be synchronous but would not have cadence. Cadence, as the musical analogy echoes, reflects a repeated, structured rhythm. A well-structured cadence is one that students can feel and recall easily; if students must repeatedly refer back to a synchronous schedule, then a true cadence is not possible.

Once a structure is established, it must be communicated to students in order to create a cadence or routine for the class. Part of this is shown in the figure above: the representation of the calendar matches its underlying structure, highlighting weeks as the unit of time. This is not sufficient on its own, however: the online class should not require students to always "pull" information at the right time, but rather should push information according to the proper schedule. Thus, we recommend using regular announcements to set expectations. We send weekly start-of-week announcements which reiterate all the assignments and tasks for the week. Reliably receiving this at the start of every week creates in students an expected routine that they will start each week with an agenda that, if followed, will lead to success in the course.

The specific details of the structure may vary for other classes; more traditional students may prefer mid-week deadlines, and certain classes may need smaller or larger units of time. The key part is to create some consistent underlying structure similar to what is dictated passively by scheduled lecture times. This, in turn, allows students to dedicate more of their cognitive resources to understanding the course content rather than keeping up with the course structure.

These strategies for creating cadence provide a structure that supports student success in the class, but they still rely on students to embrace that structure. Students may be aware of that structure but still choose to procrastinate or disappear from the course for weeks at a time. In order to foster consistent engagement, that engagement must be properly incentivized.

We recommend incentivizing that engagement through required authentic weekly activity. Activities like "Watch these videos" or "Post X times to the forum" force students to be aware of the course, but they do not incentivize authentic engagement. Instead, engagement can instead be incentivized by breaking large assignments into smaller intermittent milestones. This requires students to remain authentically invested in

the class, while also fostering a beneficial formative feedback cycle. In the class described in Figure 1, for example, students are required to complete a written assignment every week of the semester.

The risk in this structure is alienating students who truly *need* the flexibility of the online environment; these students can be accommodated by providing assignments well enough in advance that they may work ahead, while still requiring students prone to procrastination to maintain the required weekly schedule.

Reflections

In an online environment, it is remarkable how small actions can make big differences. We initially experimented with sending weekly announcements as an organizational structure for ourselves to ensure we were aware of everything we expected students to do each week, but student feedback has indicated these simple announcements are the most-appreciated thing we do. They remark that it indicates that the class is organized, shows that the instructor is engaged (which can be invisible in an asynchronous class), and helps them focus on the class content instead of the structure.

The classes that use these strategies have shown among the highest completion rates in the online Master of Science in Computer Science program, typically over 90%. A major reason for this is that students are less likely to overlook an oddly-placed deadline or fall irrecoverably behind the schedule; smaller weekly milestones mean even if a student does fall behind, they are more likely able to recover. Finally, students regularly rate online classes using these strategies highly on organization and instructor respect, indicating that students correctly perceive these strategies as intending to support them.

Forensic Facial Reconstruction: Integration of Science and Art

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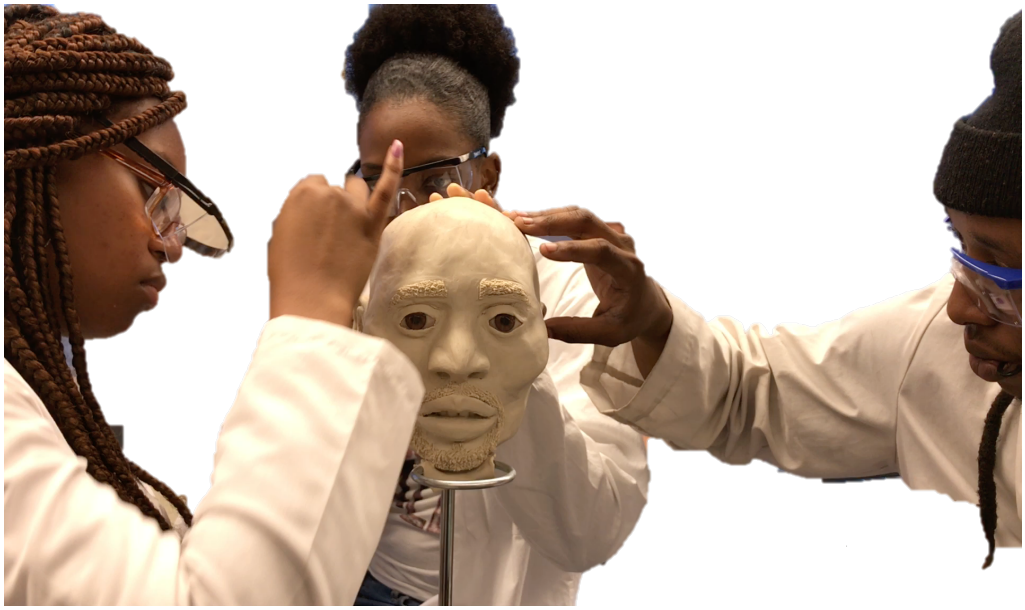
Author Biographies

Karla-Sue C. Marriott, PhD, Full Professor, has served as PI and CoPI on NIH, NASA and NSF research projects. She currently serves as PI/PD of the NIH-NIBIB-ESTEEMED program to increase the number of underrepresented researchers pursuing a career in biomedical sciences. An active scholar, she was selected as a state of Georgia Governor's Teaching Fellow (GTF) for 2015. Dr. Marriott is the coordinator for the SSU Forensic Science Program, as well as interim-chair for the Chemistry & Forensic Science department. Dr. Marriott is a self-taught freehand painter-artist. She is very active in the Savannah community and was a 2018 TEDxSavannah speaker.

Eric B. Clark, MFA, Assistant Professor, is a ceramic sculptor with interests in combining multiple construction and finishing processes to create unique forms with an industrial aesthetic. Eric is native to Savannah, Georgia; he holds a B.F.A. from Armstrong State University under the direction of John G. Jensen; M.F.A. from Georgia Southern University under the direction of Jane Pleak and Jeff Schmuki. Eric shows work nationally and internationally, receiving numerous awards and honors. Eric has been teaching art since 2011, and he is currently teaching a variety of media as an Assistant Professor of Art at Savannah State University.

Introduction

Forensic facial reconstruction is a method used in the field of forensic science to reproduce the likeness of an individual from skeletal remains, primarily used in cases of missing or unidentified persons. We developed a facial reconstruction exercise through which students explored the integration of methodologies from the sciences and the arts, while comprehending the power and potential such blending can contribute to the practice of forensic science. Students were expected to learn pertinent anatomy and develop sufficient sculpting skills to be applied towards the reconstruction of faces from unknown skulls.



Exercise Goals

1. Explore useful integration of methods from science and art.
2. Comprehend the utility of blending science and art to the practice of forensic science.
3. Master and employ specialized artistic, as well as scientific techniques towards the development of a useful and relevant product.
4. Demonstrate competency in the management and documentation of scientific data.
5. Demonstrate harmonious teamwork with accountability.
6. Demonstrate competency in the ability to search and use scientific literature.
7. Use scientific literature to support the presentation of results.

Description of Activity

This exercise was conducted in student groups over two semesters in forensic science courses *FSCI 4401: Crime Scene 1* and *FSCI 4402: Crime Scene 2*. Students were divided into four (4) groups and provided with unknown skulls purchased from Bone Clones, incorporated. The ethnicity, sex and age of each skull was known only to the instructor, and students were asked to use their knowledge of anthropology to determine sex, ethnicity and approximate age. The entire process required an extensive scientific literature review, studying anthropology, anatomy/cranial features, mathematics, 3-D digital imagery and sculpting.

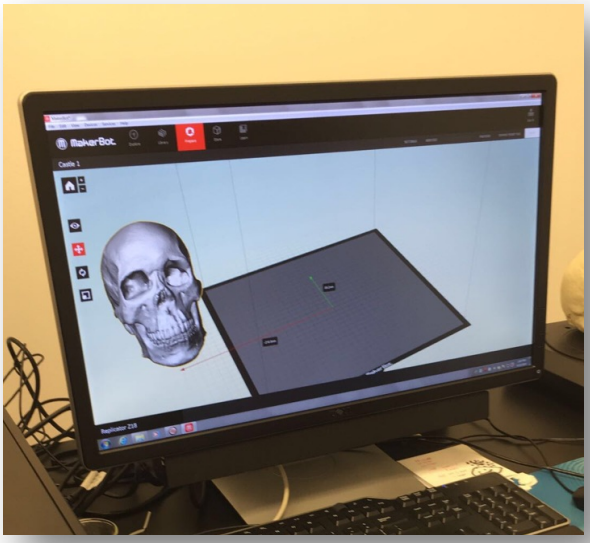
Based upon their review of the scientific literature, students agreed to apply the widely-used Manchester Method (Gupta, Sonia et al, 2015) of Richard Neave which combines the Russian and American techniques for facial reconstruction. This method involves using the detailed traces of muscle insertion on the skull to establish facial detail and form while relying on tissue thickness data (Rhine & Campbell, 1980) to model soft tissue depth.

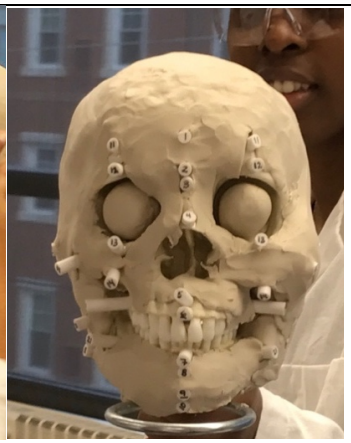
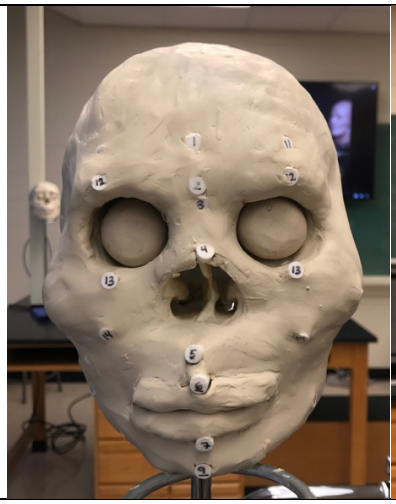
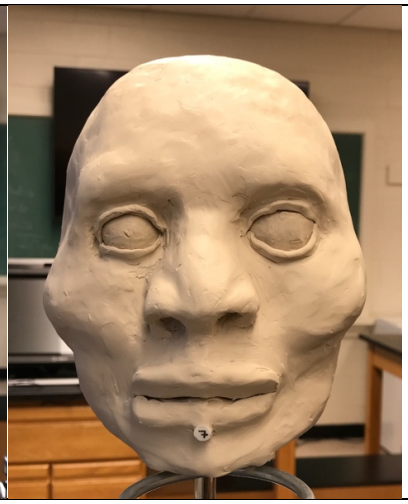
Students placed tissue depth markers on each skull to provide a blueprint before applying oil-based clay for the facial reconstructions.

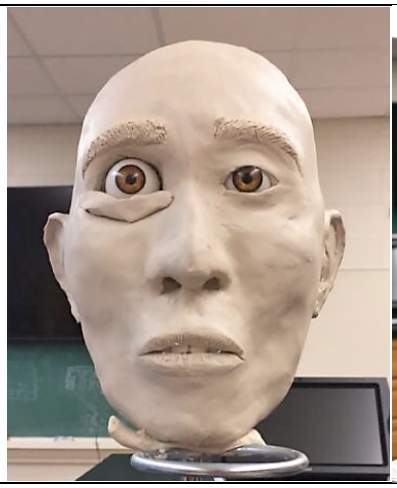
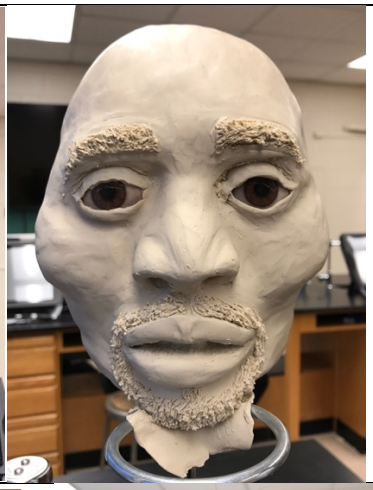
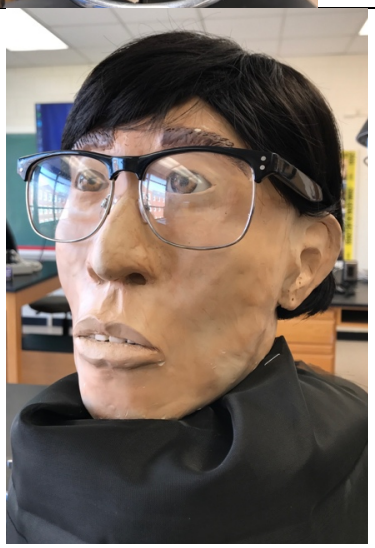
Student weekly progress is documented in the **Timeline Table** below.

Timeline with Visual Outcomes:

Weeks	**Details**	**Visual Outcomes**
1-3	Planning, literature review, reconstruction method selection (Manchester method was chosen)	

4-6	Skull examinations: age, ethnicity, and sex determinations. Teeth are also examined to indicate age and ethnicity.	
7-8	3-D laser scanning: digital record of skulls in their original state using a Makerbot Digitizer scanner.	

9-13	Learning cranial features: location and names; learning about tissue depth markers and their placement on skulls. Measurement and placement of 21 tissue depth markers on skulls.	 
14-18	Building up the face with oil-based clay to the level of the tissue depth markers. Temporary clay sphere placeholders inserted for eyes; clay face sculpting.	 
19-23	Face sculpting continued. Nose and lip sculpting, smoothing out clay on face.	 

24-29	Replacement of clay placeholders with permanent installation of artificial eyes; eyelid installation, ears and facial hair added, face sculpting as necessary.	 
30	Final products with some props added such as wig, glasses, etc. as needed.	 **African Female**  **Asian Male**  **African Male**

Group Accountability

For this project, each group selected a leader and co-leader, who were responsible for directing the project and submitting project participation accountability forms to the instructor at the end of each semester. This form serves to inform the instructor of the contribution of each individual, as group members are awarded individual grades.

Teaching & Learning Collaboration

In the first semester (Fall 2016) *FSCI 4401: Crime Scene 1* course (Instructor: Karla-Sue C. Marriott), students reviewed scientific literature, studied cranial features, and depth marker measurements. Initially the students developed a project plan with experimental procedure. Student groups were assigned unknown skulls and tasked with determining the ethnicity, sex and approximate age by taking skull measurements and examining the teeth. Students confirmed the ethnicity, sex and age approximation with Marriott before being permitted to move forward. Over the rest of the first semester, students studied cranial features in detail, learning all the bones in the skull, and placed facial depth markers on their skulls in preparation for the second semester.

In the second semester follow-up course, *FSCI 4402: Crime Scene*, Dr. Marriott partnered with Professor Eric Clark, a sculptor from the College of Liberal Arts. Clark instructed the students on how to build-up the facial features on the skulls using oil-based clay with the already in-place depth markers as guides. Students developed general sculpting skills with the use of sculpting tools. They also learned about facial geometry, symmetry and cartilage size estimation for use in sculpting the nose and ears.

Note: Crime Scene 1 and Crime Scene 2 are required sequential capstone courses for students majoring in forensic science.

Group Reflection

During the second semester, each group was asked to assemble and give written feedback as a group. Excerpts from their feedback are presented below.

1. During Crime Scene 1 and 2, have you discovered new talents or skills that previously you didn't know you had? Explain.

   Student response: We as a group can honestly say that we did discover some hidden talents/skills, like for instance one of our group members got better at doing unit conversions, another one had a natural hand for sculpting, and the third one found out some new techniques for when it comes to sculpting. While doing facial reconstruction, it has really showed some of our strengths and weakness and has improved and uncovered many skills.

2. During Crime Scene 1 and 2, are you challenged? Explain.

   Student response: Yes, challenges come in with attempting to find symmetry in the face and also with working with different people and different personalities within the group.

   The most complicated features were when we had to craft the eyelids, ears, and the nose. These were the most difficult because they are all cartilage and have no specific structure. These features depend on the person's genetic makeup.

3. During your Crime Scene 1 and 2 classes, did you use multiple disciplines to help with your project, such as chemistry, biology, painting, anthropology, mathematics, sculpting, technology, anatomy …etc? Make a list and explain how each discipline contributed to the progress of your project.

Student response:

- Biology - we had to identify certain aspects of the skulls such as width (ear to ear) and length (from the eyebrow bone to the back of the skull).
- Anatomy - helped with the muscle structure and the placement of them on the skull.
- Anthropology - we used anthropology to determine the race, sex, and age of the John Doe.
- Mathematics - to determine size and placement of the tissue depth markers; and we had to do unit conversions.
- Geometry - symmetry measurements helped us with the orientation of the cheeks and the length of the nose

Discussion & Conclusion

This project integrated seemingly disparate areas of knowledge and truly blended the arts and sciences. The poetic language that the faces evoked among students and other observers was evidence of that blending. Students discovered skills and abilities, previously unexplored as they journeyed through the emergence of the reconstructed faces, and gained a sense of competence and achievement. They developed an appreciation for the precision and limitations of scientific data, especially as it applies to determinations of age, ethnicity and sex. They also gained an understanding of the value of effective teamwork, and each discovered her/his unique strength and contributed towards the harmonious, common objective of producing a face that reliably revealed the deceased. The project was featured in the Savannah Morning newspaper "Savannah State students debut facial reconstruction projects for forensic science week" and on local television news.

References

Gupta, Sonia et al. (2015). *Journal of Clinical and Diagnostic Research,* Vol-9 (9), ZE26-ZE28.
Rhine, J. S. & Campbell, H. R. (1980). *Journal of Forensic Science,* 25:847-858.

Acknowledgements

Department of Education Title III

UWGLive: Providing Simulated Classroom Experiences to Pre-Education Majors

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Dr. Willox is an Associate Professor and the Chair of the Educational Technology & Foundations department in the College of Education at the University of West Georgia. Her department strives to prepare educators and designers to lead in authentic, technology-rich learning spaces within schools and beyond. The department houses the innovations lab, mobile innovations lab, and simulations lab.

Terri Ponder directs our simulations lab which includes UWGLive. Terri is a leader in instructional technology within the state of Georgia, coming to UWG from a long career in the public school system.

Introduction

Providing diverse, authentic classroom experiences for future teachers has been a vexing challenge for universities because it is difficult to get students the variety of experiences they need to become highly-skilled. The challenge is especially true at the freshman and sophomore level when we hope to attract students into education, as state rules do not allow students to enter existing classrooms without a pre-service certificate issued in their junior year. We have implemented an innovative approach to this challenge, using UWGLive Simulations. This immersive simulation allows students to experience their future professions in unprecedented ways. UWGLive is integrated into the nine-hour EDUC sequence, taken prior to officially entering our teacher preparation program.

Goal of Activity

The goal of UWGLive is to provide a risk-free environment for future educators to practice their craft while receiving immediate feedback from the instructor. For example, participants and/or instructors can pause the simulation at any point and receive feedback that they can immediately incorporate into the session.

This level of coaching would not be possible in a classroom with real students. Additionally, faculty members have the opportunity to design scenarios wherein the avatars can respond in very intentional ways to help ensure specific skill development. The simulator, therefore, allows students to hone their skills in all aspects of teaching, from behavior management to high-level questioning. It helps students build cultural proficiency, as well, because the avatars are of varied races, ethnicities, and abilities.

Description of the Activity

UWGLive uses state-of-the-art technology to create immersive, mixed-reality environments for participants (COE students) to practice and master teaching techniques prior to entering teaching. UWGLive Simulations include several different virtual classroom environments: an upper elementary classroom and a middle school classroom with five students ("avatars") each, and an inclusion classroom that features a student with learning and/or behavior disabilities. Adult simulations are also available allowing participants to interact with a parent, teacher, principal, or other professional.

Each session is unique and personal because the avatars do not remember past sessions. Because of this design, the participant's skills and techniques can be practiced in the simulator multiple times, which is not possible in an actual classroom.

There are a variety of avatars available to help depict classroom scenarios. Each of the ten upper elementary and middle school avatars has thier own distinct personality and background profile. The avatars' personalities and backgrounds remain consistent across each session. For example, Ethan (a middle school avatar) is an Atlanta United fan and he loves to play the video game *Fortnite*. Each time a participant interacts with Ethan, the same personality and preferences are encountered. It is the participant's responsibility to get to know and learn about the avatars, just as they would with real-life students. Below are some images of the different environments UWGLive supports.

Image 1: Classroom Environment

Image 2: Parent Conference

Although the avatars' characteristics are consistent, they do not give "canned" responses. During a simulation, the avatars are able to see and hear the participants as they present, allowing the avatars to react in real time. This encourages the suspension of disbelief, allowing participants to become fully engaged in the simulation. When first time participants interact with the avatars, they are shocked at the authenticity of the mixed-reality environment and sometimes have a hard time staying composed. Because of this, we schedule UWGLive sessions at least twice for each EDUC course.

Reflection

Each of the EDUC courses has a specific focus: EDUC 2110 Investigating Critical and Contemporary Issues in Education, EDUC 2120 Exploring Sociocultural Perspectives on Diverse Education, and EDUC 2130 Exploring Learning and Teaching. Faculty teaching these courses met to design specific UWGLive simulations that would enhance course content and facilitate student growth. Since the nine-hour sequence is not taken in a particular order, we cannot predict what experiences students may have had with UWGLive previously. Typically, in the first session, students are in disbelief that the avatars can respond to them in real time and can "see" them as they are engaging with them. As a result, each course begins with students getting to know the avatars and building a level of comfort with using the simulation.

In the first UWGLive session, EDUC 2110 students meet the middle school avatars and ask them questions about their educational experiences and their use of technology in the classroom, EDUC 2120 has students ask the elementary school avatars about their cultural backgrounds and celebrations, and EDUC 2130 has students ask the elementary or middle school avatars about their personal interests and hobbies.

Each of the EDUC courses has a second UWGLive experience more focused on the content of the courses. In EDUC 2110, students lead group discussions to the middle school avatars on internet safety and the appropriate use of technology in the classroom. In EDUC 2120, students observe an instructor/teacher interact with the elementary school avatars while recognizing unconscious biases/assumptions that are being made during the lesson. Students actually have three simulations in EDUC 2130 because this course is heavily focused on teaching skills and strategies. In one of these simulations, students observe a master teacher teach a lesson to the elementary school avatars while recognizing specific teaching skills and strategies.

While the experiences engaging in the simulation are valuable, it is the reflection and facilitation that promotes the most growth. Follow-up activities and assignments provide students the opportunity to delve deeper and consider these simulated interactions in relation to their future career choice. UWGLive supports the development of a growth mindset because it allows future educators to experience the iterative cycle of learning (Dweck, 2017). During a simulation, students can try a teaching technique, fail at implementation, receive immediate feedback, and try again. This facilitates a growth mindset because it allows pre-service teachers to experience failure in a risk-free environment and through re-correction promotes persistence and the acceptance of critical feedback. This is not easily achieved in a college classroom nor in the field. By controlling the environment in the simulation we can target specific skills and behaviors and then deconstruct and reconstruct those with the students. The follow-up reflections and in-class debriefing further support the development of a growth mindset.
For more information about UWGLive: https://www.westga.edu/academics/education/uwg-live.php

References

Dweck, C. (2017). The journey to children's mindsets–and beyond. *Child Development Perspectives, 11 (2)*: 139-144.

Student Generated Creative Exercises: An End-of-Semester Project

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Author Biography

Dr. Shainaz Landge joined Georgia Southern University in August of 2010. She completed her Ph.D. at the University of Massachusetts, Boston, and then moved on to a postdoctoral position at Dartmouth College (NH). Dr. Landge's research interests are in the area of synthetic organic chemistry, supramolecular chemistry and chemical education. She likes to engage students with interactive teaching aids to understand the complex concepts in chemistry. Her current education research focuses on student motivation and utilizing time management tools to increase student learning gains.

Goal of Activity

The goal of this creative project is to involve students in teaching each other the course material and to enhance their own basic understanding of content through various creative mediums. This activity targets challenging topics in chemistry courses and is primarily focused on developing critical thinking skills. The courses I teach clearly state that the students should be able to understand, explain, apply and evaluate the material taught in the classroom. These creative exercises particularly focus on these learning goals.

Description of the Activity

Since summer of 2013, I have included creative projects as part of my course (General Chemistry, Organic Chemistry I and II). In my introductory lecture, I give a brief talk about a creative exercise project which is worth 3-4% of the total grade depending upon the course I am teaching. After my second exam in the semester I describe the expectations of the project.

Creative projects can be selected on any topic which the students have learned throughout the semester and approximately four weeks are given to complete this project. Accepted activities may include but are not limited to: a mnemonic, an acronym, a poem, a song, video, art, games etc. The activity should help students understand the material better and make chemistry fun.

Students can work on the project with a partner and each student should participate both in the activity and writing the report. The project report should be one to two pages, and the report should address the following topics with the detailed description addressing six important points (a-f).

Name of all the students presenting (class and section):
Title of the presentation:
Description:

a) Introduction
b) Summary of your project
c) How does your project relate to your learning in this course?
d) Conclusion
e) What is your reactions to this activity?
f) References

The project is due a week before finals and a few examples of past projects are cited in the "Project Report Format" section which is uploaded on the Learning Management System (LMS, Folio). Plagiarism and university standards for student work are clearly defined.

A few examples of "possible topics" such as Nomenclature, Acids and Bases, Stereochemistry, Isomers etc. are shared on folio (our learning management system) so the students have a better idea of topic selection.

After the announcement, I share a google document with the whole class and ask them to submit their project name and the title. The class is able to see the selected topics by other students and have been advised not to select the same topic.

It takes about 2-4 days for the students to come up with a decent topic and select a partner who wants to work on the same project. The partners then discuss their project with the instructor on a *one-to-one* basis and get feedback on what a good project should look like, while also becoming more acquainted with the expectations of the project.

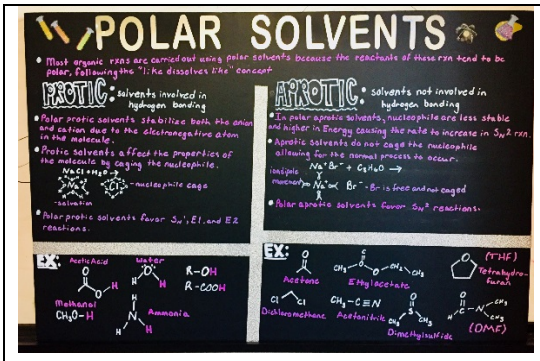
After grading, the projects are first shared with the class before the final exam and a few, unique ideas are shared on public platforms (college and personal websites) along with the college and department social media sites.

This project allows for the enhancement of student learning gains by allowing students' creative expression. This also helps the students to meet, engage, talk, gather ideas and explain their thoughts through diverse platforms. Previous literature focusing on creative activities have suggested that students' higher order thinking skills and student learning are significantly improved when they used various creative mediums (Tomasevic & Trivic, 2014; Ramirez & Ganaden, 2008). For example, in a high school organic chemistry course, students made video vignettes on different concepts. These students showed improved performance on exam questions related to the concepts on which their videos focused (Morsch, 2017).

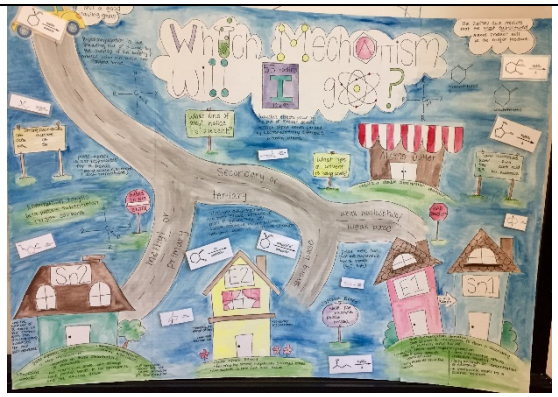
I have received an overwhelmingly positive response since I started this classroom practice in 2013. Every semester, I personally learn so many new teaching techniques from the students. I gather, use and share the well-designed projects with my incoming class on few specific topics focusing on difficult content. The student feedback and the student rating of instruction at the end of the semester have consistently reflected that students' understanding has been improved and allowed them to think about the material in depth.

Sample Student Work

A few examples (photos and links) with student's names are listed below:

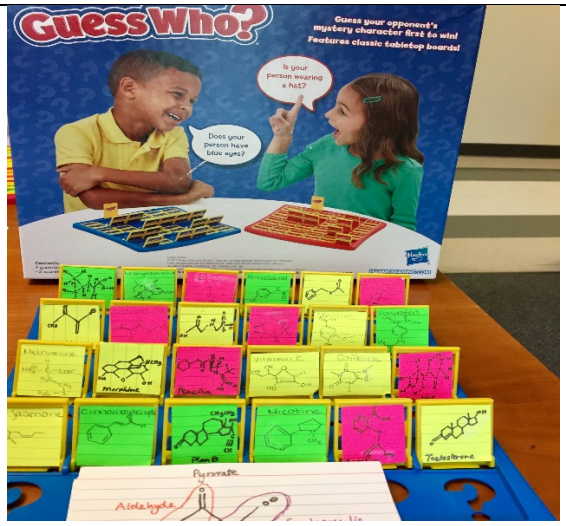


Polar Solvents by Ms. Lexi Lord & Ms. Taylor Lee



Which Mechanism will I go? by Bailee Williams

Monopoly by Ms. Hartley Causey and Ms. Kameran Land



Guess Who by Ms. Arianna Skyes and Ms. Yvonne David

Organic UNO by Ms. Kamari Jordan and Ms. Constance Moorer.

Claymation of SN2 reaction by Ms. Leann Smith and Mr. Robert Greene.

Links: For more student examples of creative exercises, visit:
Student presentations:
https://sites.google.com/a/georgiasouthern.edu/slandge/teaching/student-presentation
Student poems:
https://sites.google.com/a/georgiasouthern.edu/slandge/teaching/poems

Student Feedback

The project report surveys students with the question: What are your reactions to this activity?" Most of the students mentioned that it was a great, fun way to learn and understand the material. A few selected, distinct responses from the organic chemistry course are shared below.

> Being able to create this project gave us a better understanding of elimination mechanisms because we were able to organize the concepts in a way that is easier to follow. This project gave us an opportunity to gain more exposure to the concepts for the purpose of comprehension, memorization, and practice because we were actively creating our own examples. This project is a great study tool. (Project: You've just been Eliminated!!!)

> I was a little confused on hyperconjugation and inductive effect in class, but after further studying the material to create this project, I understand it now and can refer back to the videos in my head during the test if I get confused. (Project: Carbocation Stability)

> Working on a project like this turned a somewhat challenging or stressful topic, like organic chemistry, into a fun and entertaining project. (Project: Claymation of S_N2 Reaction: Night of the Nucleophile)

> Creative projects require the amount of thinking and understanding that we feel we strive to have toward every topic in organic chemistry. We plan to use this idea and apply it to other courses because of the usefulness. (Project: Polar Solvents)

> There are a lot of functional groups and remembering all was tricky but this game has made it easier to remember them. After doing this activity, I believe that I'm going to have an easier time during my finals. (Project: Functional Groups – Guess WHO!)

References

Morsch, L. A. (2017). Student Authored Video Vignettes in Chemistry. e-mentor, 70(3), 25-32.

Ramirez, R. P. B., & Ganaden, M. S. (2008). Creative activities and students' higher order thinking skills. Education quarterly, 66(1), 22-33.

Tomasevic, B., & Trivic, D. (2014). Creativity in teaching chemistry: how much support does the curriculum provide?. Chemistry Education Research and Practice, 15(2), 239-252.

Engagement and Relevance: Meeting Students Where They Are

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Author Biography

Marsha Loda earned her PhD at Clemson University after a successful marketing career. She brings her practical experience to the classroom and to her research. She is associate professor in the Hull College of Business at Augusta University; in 2009 and again in 2019, she was presented the university's Outstanding Professor Award. She teaches digital marketing and recently initiated a Hospitality Certificate program. Her research interests include media credibility and Millennial marketing in tourism. Recent findings show significant differences between the younger and older segments of the Millennial cohort, especially concerning their use of Visitor Information Centers.

Goal of Activity

Teaching has always been important. However, depending on the type of institutions we serve, the mental energy of professors must often focus on disciplinary scholarship. Consequently, while we are contemplating the nuances of a recent academic symposium, our students are shooting pool at the student center and discussing the merits of the cafeteria's pizza. Suddenly, it is time for class and there is a meeting of the minds, so to speak. Or is there?

On what do our students' focus? When I was an undergraduate communications major, my focus was on my date for Saturday night, what my friends were doing, my ever-changing work schedule, and *then* school (and I was a magna cum laude graduate). I knew the importance of ethics, of voting and being reliable. Yet words like "terminal" and "significant" had very different connotations to me than to my college professors.

My point is that a foundational tenant of communication is to speak to your audience using *their* language. If knowledge were measured in feet and as professors we possess – say 100 feet of knowledge – do we expect that most people already understand 75 feet of what we know when they arrive in our classroom? They probably do not, especially if they are undergraduates. The goal of the following three activities is to help meet students *where they are*.

1. Remember what it was like when you didn't know

I am not suggesting we "dumb down" our lectures, but that we assume little background knowledge or subject lingo. Lecturing to students using terminal degree language is akin to a physician expecting you to understand your diagnosis of carotid endarterectomy in the same way he or she does - unless you are a doctor, of course…which is the point. Even *The New York Times* is written for the tenth grade level. (I asked my Notre Dame-grad husband to proofread this and he actually said, "What the @$&# is a terminal degree." Yes, really.)

When explaining a new concept, picture yourself in your undergrad classroom and think, *what would have helped you understand at that time in your life?* I try to create examples the students relate to, and in their language. For example, on the first day of Consumer Behavior class, I take off my jacket to reveal a t-shirt that says "Cold Beer Makes You Smarter." The students snicker. I explain that the shirt succinctly summarizes the class: the importance of knowing your target market and constructing messages that resonate with them. (I include that if more than one beer is involved, the reverse action occurs!) Lastly, I pose this question: would a shirt saying, "orange juice makes you smarter" get the same classroom response? They get it. They remember it. They relate.

2. Guide students to teach themselves

Consumer trends tell us that younger generations spend a higher percentage of their discretionary assets on travel; they seem to crave experiences. So I give them the experience of "teaching" about half of each class period. With increasing technology, students sometimes question classroom relevance. If they need to know something, they can Google it or learn it online with LinkedIn Learning or other emerging, credible platforms. My role as professor is to make the textbook relevant. I do this by *requiring* their active involvement.

For example, for each chapter of a text, I lecture for approximately 20 minutes. I then turn the classroom over to three-to-five students who were assigned roles well in advance; all students turn in the assignments, but only 3-5 present formally. Assignments vary depending on the topic. Usually, all students must express the key point of a given chapter and why, with the understanding there is no right or wrong answer – just a key learning or "aha moment." After one student presents his or her key point before the class, a discussion ensues about others' key points. Next, the assignment may be to "assess the world around you, and find examples of chapter subject matter." For instance, I lecture about television as one option for advertisers, including the criteria and appeals to increase a television ad's success. Instead of showing great examples, students must find, show, and defend them. Who was the target market? What was the ad's objective? Why was that creative approach used?

This, too, helps meet students where they are. Rarely would I pick their television ad examples, but because the students choose them, we spend class time on examples relevant to them. My job is to ensure their key points and examples are focused and accurate. Not only are students more engaged, they learn to see real life examples of academic subjects all around them. (Students often comment I have ruined their Super Bowl fun forever. They can't enjoy the commercials for analyzing them.)

3. Think way *outside the textbook*

Textbooks are often written like academic journals by people with "terminal" degrees and with little appeal to college students. I not only supplement the text with relevant professional journals and industry certification materials, I even use (gasp) Hollywood. No matter your skills as a professor, no lecturer can help marketing students understand the Baby Boom generation better than the movie version of "Hair" (students say they think *very* differently about their grandparents!). Likewise, future hospitality managers are amazed at the complexity and nuances of wine after watching "Somm." I am a good teacher, but I rarely *amaze* with my lectures. Carefully selected movies are another strategy to reach students where they are. When students are guided in advance of such an assignment with carefully crafted discussion questions, movies can deliver intelligent messages that resonate. Stay alert for any tools (even a t-shirt) that can drive home a message.

In summary, to better engage students in the classroom, let us meet them where they are. Remember, students only know a "few feet" of what we know. Feeding students with a firehose likely does not quench their thirst; rather, it probably just dampens their desire for learning. Because I observe that my students enjoy being active, I shorten my lecture and *require* their involvement in the classroom. Lastly, textbooks may be the backbone of my class, but the non-traditional materials are what make textbook concepts meaningful. I urge you to think about your end goal for students. What is the desired or usual outcome for an undergraduate degree in your discipline? Understand what students need to know to be successful after they leave your institution, then meet them where they are to propel their futures.

References

Morsch, L. A. (2017). Student Authored Video Vignettes in Chemistry. e-mentor, 70(3), 25-32.

Ramirez, R. P. B., & Ganaden, M. S. (2008). Creative activities and students' higher order thinking skills. Education quarterly, 66(1), 22-33.

Tomasevic, B., & Trivic, D. (2014). Creativity in teaching chemistry: how much support does the curriculum provide?. Chemistry Education Research and Practice, 15(2), 239-252.

Closing the Teaching and Learning Loop with an Assessment Gradebook

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Author Biography

Dr. Chunlei Liu received his Bachelor and Master of Science degrees from Wuhan University in China and his Ph.D. in Computer and Information Science from The Ohio State University. He is now a Professor in the Department of Computer Science at Valdosta State University. He was the ABET Accreditation Coordinator for VSU's Computer Science program and led the program's successful accreditation in 2016. Dr. Liu's research interest is in computer networks, scientific computing, computer science education, accreditation, and assessment.

Goal of Activity

A very important goal of teaching a course is to meet the learning outcomes. Even though learning outcomes are almost always listed in the syllabus, instructors often lack a procedure and a tool to measure whether the learning outcomes are met, let alone to identify problems and weaknesses and propose changes for future offerings of the course. In such a situation, teaching and learning without proper assessment is not a closed loop, where you can iterate and make continuous improvement semester after semester.

Measuring whether the learning outcomes are achieved and making continuous improvement are also the requirements of many accreditation agencies. In the preparation for the ABET accreditation of our Computer Science Program at Valdosta State University, as the accreditation coordinator, I designed an assessment gradebook tool for our faculty to assess their courses.

Since 2010, this tool has helped us identify numerous problems and make many improvements in our courses. The ABET evaluation team visited our campus in September 2015 and concluded that our Computer Science program had no deficiencies, no weaknesses, no concerns, and excelled the criteria for accreditation. In August 2016, they granted us six years of accreditation, the longest of their accreditation period.

The method and procedure of this assessment gradebook can be applied to all disciplines and can be used for any course assessment to close the teaching and learning loop so instructors can identify problems and make continuous improvement in their courses. In this paper, I will share this practice with fellow faculty members.

Assessment Procedure

The implementation of the assessment gradebook consists of the following steps.

1. Establish a common set of learning outcomes among all instructors who teach the course. These objectives are common among faculty members and stay stable for several years to maintain the course's consistent role in the curriculum, but can also be updated when needed.

2. Select a few typical assessment questions for each learning outcome and make sure these questions or similar questions are used in homework, projects, quizzes or exams to assess students' knowledge and skills for this learning outcome. These assessment questions act like probes in the assessment and may be slightly different among different faculty and in different semesters, but they should assess the specific knowledge or skills needed to achieve a learning outcome. In order to achieve a reliable result, each learning outcome is usually assessed by three or four questions.

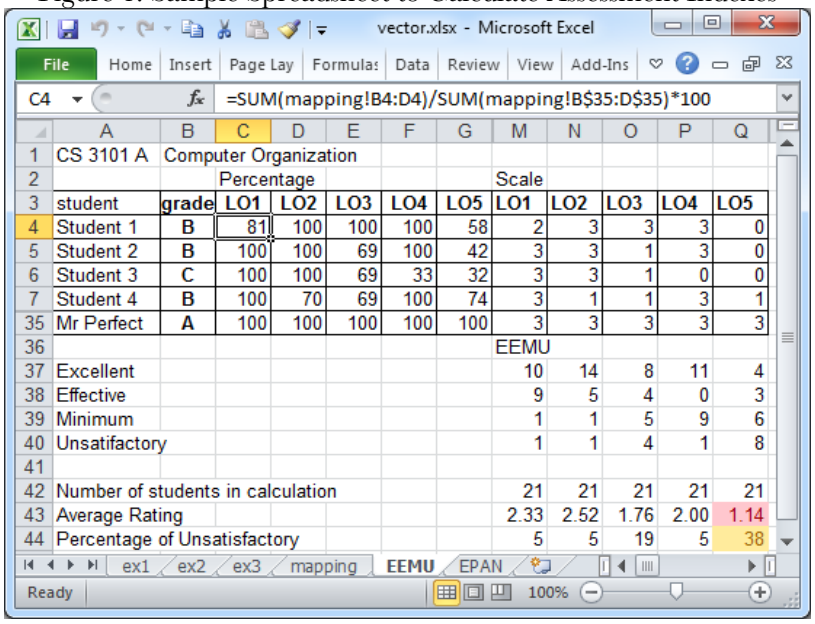
3. Build a spreadsheet (see Figure 1) to facilitate the data entry and to calculate the assessment indexes. The spreadsheet allows the instructor to enter all students' test scores for the assessment questions, and calculate the EEMU (Excellent, Effective, Minimal, and Unsatisfactory) vector for each learning outcome, i.e., the number of students whose test average score for the assessment questions is above 90% (Excellent), between 75% and 89% (Effective), between 60% and 74% (Minimal), and below 60% (Unsatisfactory). It then calculates the Average EEMU Rating as:

$$\frac{3\times \text{Excellent} + 2\times \text{Effective} + 1\times \text{Minimum}}{\text{Excellent+Effective+Minimum+Unsatisfactory}}$$

and the Percentage of Unsatisfactory as:

$$\frac{\text{Unsatisfactory}}{\text{Excellent+Effective+Minimum+Unsatisfactory}}\times 100\%$$

Figure 1. Sample Spreadsheet to Calculate Assessment Indexes



	A	B	C	D	E	F	G	M	N	O	P	Q
1	CS 3101 A	Computer Organization										
2			Percentage					Scale				
3	student	grade	LO1	LO2	LO3	LO4	LO5	LO1	LO2	LO3	LO4	LO5
4	Student 1	B	81	100	100	100	58	2	3	3	3	0
5	Student 2	B	100	100	69	100	42	3	3	1	3	0
6	Student 3	C	100	100	69	33	32	3	3	1	0	0
7	Student 4	B	100	70	69	100	74	3	1	1	3	1
35	Mr Perfect	A	100	100	100	100	100	3	3	3	3	3
36								EEMU				
37	Excellent							10	14	8	11	4
38	Effective							9	5	4	0	3
39	Minimum							1	1	5	9	6
40	Unsatisfactory							1	1	4	1	8
41												
42	Number of students in calculation							21	21	21	21	21
43	Average Rating							2.33	2.52	1.76	2.00	1.14
44	Percentage of Unsatisfactory							5	5	19	5	38

4. Identify learning outcomes that are not met. Our criterion for judging whether a learning outcome has been met is:

$$\textit{Average EEMU} \geq 1.5 \textit{ and Percentage of Unsatisfactory} \leq 20\%$$

This criterion has two aspects. The average EEMU rating represents the overall student performance. A rating lower than 1.5 means the majority of students have not quite achieved this learning outcome. Revising the teaching approach or spending more time on related topics, for example, can help to improve the average. A 20% or higher Percentage of Unsatisfactory rating means the students' learning on this learning outcome is very uneven. Individual conference or homework comments for the weak students, for example, can help to reduce the Percentage of Unsatisfactory rating. The numbers 1.5 and 20% are empirical, but have served our purpose pretty well.

In the assessment gradebook, the mapping between the input spreadsheet and the calculation sheet and the calculation formulas for the assessment indexes are built in. Once the instructor enters the

test scores for the assessment questions, the calculations are performed, and any unmet learning outcomes are marked with orange or yellow colors automatically.

5. The final step of the assessment is to reflect on the analysis results and to propose actions of improvement for future offerings. Besides the quantitative data like the EEMU vectors, the instructor can also document qualitative results such as Student Feedback for Professor, Student Opinion of Instruction, Peer Evaluation of Teaching, etc. The instructor then proposes actions for course improvement, which will be the basis of modification for future offerings of the course.

Reflection

1. The assessment method and procedure described here have been used in our ABET accreditation and have been proved to be effective in identifying problems and weaknesses in course teaching and learning.

2. The assessment gradebook is designed to facilitate data input and to automate assessment calculation. Modifying an existing gradebook for a new course takes only about half an hour. Adding the test score entry time, it takes only one hour or so to conduct a quantitative assessment of the teaching and learning in a course.

3. At the end of each semester, I usually take a couple of hours to reflect on how I taught the course and how well the students learned, gauge what activities were effective and what were not, and write down things I would do differently in the future. In a few years, I will have a well-documented list of techniques and activities for good teaching. My students will benefit tremendously from the few hours I spent each semester on the assessment and continuous improvement. When the reevaluation for accreditation comes, I will have well-documented assessment data and proof of continuous improvement.

Unfolding Case Study to Increase Student Learning and Clinical Judgement

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Author Biographies

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Dr. Lauren Boardman is an Assistant Professor of Nursing at the College of Coastal Georgia. Her specialty areas include critical care, psychiatric/mental health and behavioral nursing, simulation, research and evidence-based practice. Her undergraduate baccalaureate degree is from The Ohio State University, Master's degree from Otterbein University, and Doctoral degree from Duquesne University. Dr. Boardman has published original research manuscripts on nursing student resiliency and currently is conducting further research in this area.

Introduction

Over the years, teaching strategies have had to drastically change to meet the needs to today's learner. Innovative approaches to teaching and remediation are required to enhance the student's learning experiences. For the faculty of the College of Coastal Georgia, this means adopting practices to build clinical judgment through narrative pedagogy and applied learning, which, in return, increases the level of critical thinking and enhances application of course material to clinical and patient scenarios. Unfolding case studies can be threaded into a kinesthetic activity to challenge students to apply main concepts from didactic content.

An example currently being conducted in Coastal Georgia's BSN program involves a month-long, unfolding case study where the students are introduced to a young male who, on day one presents to the emergency department (ED) after being in a motor vehicle accident. As the week's progress, students are given additional patient information, in addition to the presenting baseline subjective and objective data. Each simulation day students work on a concept map with the facilitator to identify potential complications during their nursing shift, anticipate what interventions would be required with each complication, and how they would evaluate if interventions were successful or required further action.

Goal of the Teaching Activity

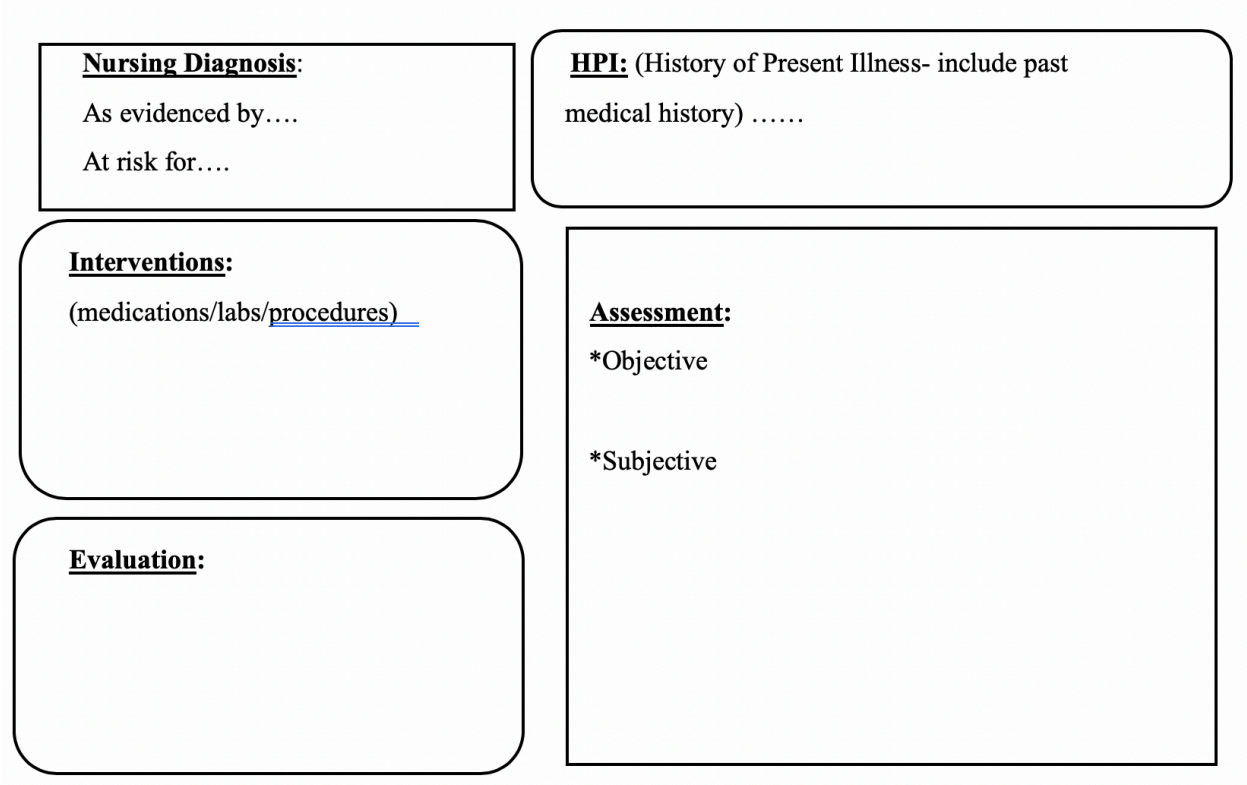
Through this month-long unfolding case study, concept mapping, and simulation, the goal is for the students to enhance critical thinking skills, build clinical judgement, and bridge the knowledge/theory-to-practice gap. Faculty use a fluid model of assessment, analysis, synthesis, and evaluation to engage students at higher cognitive domains, ultimately improving student learning outcomes. Building on previously learned knowledge, skills, and experiences through the lens of clinical judgment is the ultimate goal, and seeks to meet the desires of employers and the needs of complex patients seen in clinical practice.

Description of the Teaching Activity

Motor vehicle accident unfolding case study & simulation

During the month-long clinical rotation, students spend two days/week on a clinical unit at the hospital. On the second day students spend their last four hours of clinical in the simulation lab on the college campus. During this time, they follow a patient through an unfolding case study. Each week the patient scenario progresses to involve a new complication, either from the initial motor vehicle accident or care received. The patient experience ranges from rib and leg fractures leading to pneumothorax and surgery, hypovolemia, cerebral edema, an infected surgical wound resulting in sepsis, and eventually, ending in end-of-life care. The students and facilitator walk through each patient case using concept mapping (Figure 1) to identify pertinent data, causes of the current health conditions, potential complications, interventions, and evaluation of care. In addition to concept mapping each patient scenario, students engage in specialized assessments and are introduced to critical care skills and monitoring, all of which the student will encounter in didactic content delivered throughout the semester. Students are instructed on newly introduced material and skills, and are allowed practice time before the simulation begins.

Figure 1 – Picture of Concept Map used



Sessions are video/audio recorded, and this is used during focused debriefing following the *debriefing for meaningful learning model*, where students engage in deeper learning through analysis of performance, peer discussion, and guidance from the simulation specialist who is leading the debriefing.

Case Presentation:

24-year-old unrestrained passenger is severely injured during a roll-over motor vehicle accident. Patient presents to the ED on a back board and c-collar with multiple skin abrasions, displaced left lower leg fracture, 4th and 5th broken ribs, possible pneumothorax, and large facial laceration.

Week 1: Patient presents from the ED and experiences episodes of hypovolemia; treatment includes insertion of a central venous catheter for fluid boluses, and is waiting for imaging to clear c-spine/spinal precautions; outcome of the interventions is stabilization of blood pressure; students learn spinal precautions, in-line stabilization, trauma assessment, and review central line care and positioning of a patient related to their symptoms.

Week 2: Patient presents with a pneumothorax and is prepared to go to operating room for leg fracture fixation, and comes back in hypertension (HTN) crisis; treatment includes chest tube care, troubleshooting for air leaks in the chest tube, and management of HTN; outcome of the interventions is further stabilizing the patient and identifying post-operative surgical wound infection; new skill/assessment is chest tube management, and surgical wound assessment is reviewed.

Week 3: Patient presents with cerebral edema following HTN crisis during and after the operating room, and the patient's surgical incision infection worsens; treatment includes neurologic assessment/positioning, intracranial pressure (ICP) monitoring and ventriculostomy management; outcome of the interventions is continued neurologic impairment in which the student must decide if end-of-life care should be addressed as the patient has a full code resuscitation status; new skills include ICP and ventriculostomy care/monitoring, end-of- life care, sepsis screening, taking blood cultures from central line, reviewing focused neurological assessment.

Week 4: Patient presents as septic and has signs of end organ failure; treatment includes sepsis management (pseudo hypovolemia-vasopressive medication, fluid blousing, central venous pressure and

arterial line monitoring); the outcome unfortunately is end organ failure and multiorgan dysfunction syndrome in which the students will work through end-of-life care issues, including educating and comforting family at the bedside; new skills taught are critical care monitoring parameters, zeroing pressure lines/systems, end-of-life care.

In addition to completing the concept map, students must discuss and answer additional questions which include: List three potential complications for this patient; For each complication list one preventative intervention with rationale; Should one of the above complications occur, list one intervention the nurse might anticipate the provider ordering; Order interventions based on highest (immediate) to lowest (needed but not immediate) priority and provide the rationale behind prioritization; Based on previous answers, what assessment findings would indicate 1) Improvement in status, 2) Decline in status, 3) Unchanged status; If status of patient is unchanged, what additional interventions may be considered?

Since Coastal Georgia has been incorporating such teaching activities in nursing courses and clinical/laboratory components, student success, retention, graduation rates, and 1st time NCLEX-RN test taker pass rates have greatly increased (2013 = 71% - 79%; 2015 - 2019 = 94% - 100%, including 5 consecutive years of at least one nursing program having 100%). Today's student needs more engaging and creative instruction that stimulates thinking in a comprehensive manner. This teaching activity is just one example of the style of education that is embedded in the ASN and BSN programs at Coastal Georgia, which have enhanced student learning and could be replicated with most programs and schools to meet the needs of today's learner.