CeTEAL News, January/February 2020

CeTEAL, Coastal Carolina University

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Signature Pedagogies Learning Communities: A Faculty Perspective
CeTEAL Staff
CeTEAL’s 2018-2019 Signature Pedagogies Learning Communities gave faculty the opportunity to examine the signature pedagogies of their fields and engage in the scholarship of teaching and learning. The previous issue of CeTEAL News and the issue you are currently reading contain summaries of the research that faculty produced during their time in the learning communities. However, the value of participating in learning communities with colleagues goes beyond the research. As you will see below, working with colleagues in other disciplines and colleges has its own value.

Here are some comments from faculty about their experiences in the Signature Pedagogies Learning Communities:

"Working with a multidisciplinary group of colleagues provided me with valuable feedback from diverse viewpoints which was very beneficial. Ideas from colleagues in other disciplines sparked questions and ideas about similar topics, but in different ways. Also, as you work with scholars in other disciplines, you cannot hide behind the jargon. You are forced to think, speak, and write in a way that is comprehensible for scholars in other disciplines to understand."

— Rhonda Miller

"During my time in the learning community, I conducted my first scholarship of teaching and learning [SOTL] project. This project makes me think about the scholarship of teaching and learning as well as collecting data about instructional strategies I implement with my pre-service teachers. This data could help me make decisions about the strategies I use in my classroom."

— Nicole Uphold

"I realized through this project that many of the changes I have implemented in my classes over the years could have produced published SOTL [scholarship of teaching and learning] research. This realization makes me more critical of the changes I want to make in my classes and makes me want to do a better job of consulting existing literature for best practices before implementing."

— Clayton Whitesides

Continued on Page 10.
Professional Development Opportunities

Research and Teaching: Using Mendeley and Zotero for Collaboration and the Classroom

This class will have an introduction to the basic functions of the free citation management tools Mendeley and Zotero. Participants will also learn methods and ideas for using Mendeley and Zotero in collaboration with colleagues, and for classroom activities and assignments.

Participants will:
- Learn the basics of free citation management tools (Zotero and Mendeley).
- Understand how to use a citation manager for research collaboration with colleagues.
- Explore different ways to use a citation manager in the classroom.

Date: Tuesday, March 17, 2020
Time: 12:15 p.m.
Location: KRNS 210

The Productive Writer: Managing Your Time, Process, and Energy

Writing is an important part of our lives. The faster, better, and more efficiently you can write, the more successful you’ll be. Whether you’re a researcher, graduate student, instructor, or a professional who writes heavily, this session will present the strategies and tools that will make your life much easier. The practical suggestions presented will help you consider ways to get unstuck and keep writing.

Participants will:
- Identify well-established habits of writing.
- Evaluate ways for managing time, work, and energy.
- Select strategies and tools that are applicable to your writing style.

Date: Wednesday, March 18, 2020
Time: 1 p.m.
Location: KRNS 210

Build Your Scholarly Presence through Journal Metrics

Journal metrics help authors track citation patterns, article impact, and online reader attention and engagement. This session will define metrics, explain how metrics are calculated, and distinguish traditional metrics from newer “alt” metrics such as downloads and social media mentions.

Participants will:
- Identify measures of journal impact and quality.
- Identify tools that measure impact factor.
- Utilize metrics to select journals for publication.

Date: Tuesday, April 21, 2020
Time: 9:25 a.m.
Location: KRNS 210

Visit coastal.edu/ceteal to register for sessions.

FROM THE DIRECTOR

Jenn Shinaberger, M.S.Ed., MPIA

This issue of CeTEAL News is the second of two special issues focused on CeTEAL’s inaugural Signature Pedagogies Faculty Learning Communities grant program which was supported by student achievement funding.

The initial research that came out of the Signature Pedagogies program was impressive. Each of the faculty members who participated in the learning communities presented their research to the CCU community and submitted work to a disciplinary conference, a teaching and learning conference, and/or a peer-reviewed journal. In addition, CeTEAL presented about the experience at the Lilly Conference in Bethesda, Md., in May 2019.

In this issue, six faculty share the research they completed as part of the grant program. Some projects are ongoing, so the reporting in these pages is preliminary.

While we hope to offer another opportunity for faculty to participate in the Signature Pedagogies grant program, CeTEAL encourages all faculty to explore the signature pedagogies of their disciplines as a way to understand the unique practices and ways of thinking that define how their students will be taught. Please contact CeTEAL at ceteal@coastal.edu if this is something you would like to discuss.

Hope to see you in a CeTEAL session soon!

-Jenn
A Picture is Worth a Thousand Words: Strategic Figures in Physical Geography

Clayton Whitesides; associate professor, anthropology and geography; Edwards College of Humanities and Fine Arts

Geography education in North America has been criticized recently for not providing students with enough depth and width to be successful geographers (King 2017). Training students to identify and understand the important figures (images, maps, diagrams) from a textbook during study outside of class may allow in-class instruction to focus on in-depth concepts and produce better geographers.

The amount of time college students spend on educational activities has declined since the 1960s, and today, students spend more time on leisure activities in a day than on studies (Babcock and Marks 2011). To prepare incoming college students seeking a degree in geography, readings are assigned prior to the first day of class. Surprisingly, students who studied the readings prior to class were not as prepared as their instructors anticipated (Birnie 1999). These articles suggest that the limited time students spend studying outside of class is at a premium, and a student’s ability to identify critical content in assigned readings (i.e. textbooks) is of utmost importance. They also demonstrate that although students read and studied content outside of (prior to) class, they may not have been equipped to identify the most important content in their readings.

As technology increases the ease with which we can produce visual representations of data, it becomes increasingly important for students to be able to understand the value of the figures that are included in their readings. Consequently, training students to identify and interpret the importance of figures may improve their access to knowledge.

For my Signature Pedagogies Learning Community research, I asked the questions:

- What are the important figures in a chapter of an introductory physical geography textbook?
- Are students able to identify the most important figures in a college-level, introductory physical geography textbook?
- Does teaching using nothing but figures improve a student’s ability to identify the important figures?

The study was conducted in my Spring 2019 Introduction to Physical Geography (GEOG 201) course. The course was taught in a traditional face-to-face format and 17 students remained after the final withdraw date. Intro to Physical Geography satisfies the “Scientific Concepts” requirement of Coastal Carolina University’s Core Curriculum. It is also a required class for all anthroplogy and geography majors and is also an elective for marine science majors. Consequently, the students involved in this study came from many different disciplines and stages in their academic careers.

“… the limited time students spend studying outside of class is at a premium, and a student’s ability to identify critical content in assigned readings (i.e. textbooks) is of utmost importance.”

—Clayton Whitesides

To address the first research question listed above, the arid/aeolian environments and glacial/mountain environments chapters were analyzed in six introductory physical geography textbooks. The figures from both chapters in all six books were evaluated to determine which figures transcended books. If a similar figure was found in five or six of the books, it was deemed an “important” figure to the understanding of physical geography. Preliminary results identified six figures that portrayed the same information across five of the six textbooks. Three of the six figures were nearly identical and were found in all six books.

At the beginning of the Spring 2019 semester, students who voluntarily engaged in the research were given a survey via Qualtrics in which they evaluated the arid/aeolian environment chapter to identify what they deemed the five most important images. The survey asked students to evaluate the scientific principle(s), aesthetics, strengths, and weaknesses of the figures. Students commented on what aspects of the figure influenced their decisions. The arid/aeolian environment chapter was used under the assumption that CCU undergraduates do not have as much experience/familiarity with these environments/processes and this would provide a base level evaluation.

Throughout the Spring 2019 semester, I taught my Intro to Physical Geography course using nothing but “important” figures. The figures were sometimes drawn/recreated on the whiteboard or projected on a screen. The purpose of lecturing in this format was to expose students to “important” figures, spend in-depth discussion during class on the figure material, and provide students with figure-reading skills that could be used during study outside of class.

At the end of the Spring 2019 semester, the same survey was given to the students, but they assessed the glacial/mountain environment chapter in the textbook. Again, this chapter was selected under the assumption that students were less familiar with these environments and provided a format for them to apply their figure-reading skills.

In the arid/aeolian environments chapter, students were able to identify two of the six important figures. Although they were able to identify a third of the figures, their reasoning for selecting the images suggested that aesthetics was more important than the scientific principles being conveyed.

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Distance Versus Face-to-Face Supervision of Pre-Service Special Educators

Nicole Uphold; associate professor, special education; Spadoni College of Education

Field experience has long been incorporated into teacher education programs and is considered to be among the most important aspects of pre-service education (Brownell, Ross, Colon, and McCallum, 2005; Mamlin, 2012). During their field experience, teacher candidates fuse their knowledge of content and teaching strategies and practice their skills by teaching students in the classroom. A key feature of this field experience is supervision of the pre-service teacher’s teaching (DeAngelis, Wall, and Che, 2013). Providing teacher candidates with support and feedback is crucial during this learning time. It is an opportunity for both the university supervisor and cooperating teacher to supervise all aspects of the teaching process and foster professional growth. Supervision of the teaching allows the pre-service teacher to receive immediate feedback on the teaching experience and learn about strengths and areas to improve.

Unfortunately, there are several challenges to field experiences and supervision. It can be difficult to find schools and teachers who are willing to mentor a pre-service teacher, particularly a pre-service special education teacher (Billingsley and Scheuermann, 2014). Special educators often have challenging teaching schedules where they might be co-teaching for part of the day and pulling students out of the general education classroom to provide small group instruction for the other part. In addition to planning and teaching, they have large paperwork responsibilities with creating and implementing Individualized Education Plans (IEPs). Special educators want to mentor future teachers, but state that they do not feel they have time (Mahon, Bryant, Brown, and Kim, 2010). As a result, universities often need to look beyond the local area for field experience placements for their pre-service educators. This leads to additional issues for the university supervisors as traveling to field experience sites is time consuming and expensive.

In response to these challenges, universities have offered distance supervision of teacher candidates. Distance supervision allows the university to “visit” the classroom remotely using technology such as web-based video conferencing to see the teacher candidate educating students.

The purpose of this study was to examine pre-service special education teachers’ views of distance versus face-to-face supervision of their field experiences. The research questions included: what are the strengths and challenges of using a video-based synchronous platform for supervision of special education teacher candidates according to students?; and what are the strengths and challenges of using the traditional face-to-face method for supervision of special education teacher candidates according to students?

The research was conducted with 13 students enrolled in EDSP 320: Measure Student Progress: Field Experience in Spring 2019. Participants were asked eight open-ended questions about the strengths and challenges of both face-to-face and distance supervision. They were also asked to provide a rationale for their preferred supervision format. Preliminary results show participants preferred face-to-face supervision, though many did not have a preference. Challenges to distance supervision included anxiety about technology working correctly at the time of the observation and lack of communication between the cooperating teacher and the supervisor. Some participants stated they liked receiving the immediate feedback after the face-to-face observations.

Universities often look to reduce the cost of pre-service teacher education. While this is not occurring at Coastal Carolina University, there is no guarantee this won’t impact us in the future. As we need more supervision, distance supervision can allow this to happen without incurring costs.

“During their field experience, teacher candidates fuse their knowledge of content and teaching strategies and practice their skills by teaching students in the classroom.”

—Nicole Uphold

Continued on Page 10.
Increasing demand for teacher accountability means teachers must work to meet both the academic and behavioral needs of their students. Students with emotional and behavioral disorders and students with other types of disabilities can display challenging or inappropriate behaviors that present obstacles to academic and social skill progress (Wehby, Symons, & Shores, 1995). Student teachers often struggle with classroom management.

The skillful management of students’ disruptive behaviors can help teachers to maximize classroom time for instruction (Musti-Rao & Haydon, 2011). Behavior-specific praise is a low-intensity strategy that can help to reinforce the repetition of appropriate academic and social behaviors, increasing classroom engagement and on-task behaviors while reducing aggressive behaviors when implemented with fidelity (Ennis, Roer, Lane, Menzies, Oakes, & Schellman, 2018).

As part of the Signature Pedagogies Learning Community grant, this Spring 2019 study examined whether the use of a content acquisition podcast (CAP) about behavior-specific praise paired with emailed feedback increased pre-service teachers’ use of behavior-specific praise statements in the classroom. A CAP is a multimedia intervention that can be used to pre-teach vocabulary, teach procedural steps, and teach instructional procedures. CAPs use explicit instruction with minimal visuals and text on the screen to reduce cognitive load. Since CAPs are in video format, they can be used almost anywhere and any time of day. If stored in a way that is accessible to the viewers, CAPs can be reviewed as often and as many times as needed. CAPs can be used across disciplines.

For the study, I created a CAP video on behavior-specific praise using signature pedagogies of explicit instruction and intensive instruction. Explicit instruction is an instructional practice that presents new content and skills in a succinct manner. The teacher strategically chooses examples, non-examples, and language to facilitate understanding while also eliminating distracting information. Intensive instruction involves working with a small group on high-priority skills which are critical for academic success. The intensive instruction in this study focused on the use of behavior-specific praise in the classroom.

“A CAP is a multimedia intervention that can be used to pre-teach vocabulary, teach procedural steps, and teach instructional procedures. CAPs use explicit instruction with minimal visuals and text on the screen to reduce cognitive load.”

—Rhonda Miller

Five students in EDSP 450: Internship in Special Education participated in the study. These second-semester senior students were doing their full-time student teaching in the schools. I presented the video training to these pre-service teachers in a one-on-one supervised setting.

The pre-service teachers were observed over a 10-week period. Observers recorded (written by hand or typing on a laptop) the actual behavior-specific praise statements the student teachers used, and then counted the number of statements used in a 15-minute observation. The number of behavior-specific praise statements used was recorded on a line graph. Students were observed two to three times per week for 15 minutes per session. Students received emailed feedback that included a list of behavior-specific praise statements that participants had used and an updated graph of the number of behavior-specific praise statements used across all sessions, showing progress. Results of the study demonstrated an increase in the use of behavior specific praise statements across participants.

Preliminary results seem to show a moderate effect across participants. Data has high variability for the first two participants. Data is more stable for participants 3 and 4. Participant 5 does not have enough intervention data to report due to running out of time. Social validity data also shows that student teachers did not think behavior-specific praise was necessary when students were quiet and compliant.

More analysis needs to be done (e.g. interobserver agreement), and I believe this study will be a jumping off point for other related studies. Replication of the study needs to be done in classrooms that are at the same level (e.g. all elementary) or with teachers who are teaching a similar number of students (e.g. small groups of five to ten or large groups of 15 or more).

As a result of this project, I am starting to cultivate partnerships with other colleagues who are curious about the study and how we use CAPs in our special education program as well as how we can use CAPs to study other things. Some of my colleagues and I have already been discussing a group design study in which we might look at CAPs on behavior across early childhood, elementary, and special education pre-service teachers.

The study provided benefits beyond the data gathered. The CCU students who participated in the training have gained another classroom management tool that they can use for years to come as they move through their careers as educators. The knowledge of behavior-specific praise they have gained will help them to manage behaviors of students with and without disabilities. The public school students who the CCU students were working with received positive feedback on their classroom behavior.
Factors Impacting the Perception of Open Educational Resources in Higher Education

Monica Fine; chair/associate professor, marketing, hospitality, and resort tourism; Wall College of Business

Higher education is a very large investment for students to undertake, and in addition to steep tuition costs, textbooks have proven to play a large factor in student debt. In today’s society, textbooks aren’t the only course materials instructors require their students to purchase. Access codes have become an increasing phenomenon within higher education. These codes are usually required for students to complete homework assignments and are often the same price, if not more, than the textbook (Pritchett 2017). However, with the rise of Open Educational Resources (OERs), instructors are moving away from traditional textbooks and implementing these resources. OERs are defined by the Hewlett Foundation as “teaching, learning, and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation, and redistribution by others with no or limited restrictions,” (Hewlett Foundation 2018). OERs provide instructors with flexibility in the materials they are using to teach their students and allow them to customize the course material to match their teaching preferences (VTLibraries 2016). These materials also provide students with easier access to course materials and flexibility in where and when they access them (Cooney 2016). In addition to accessibility and flexibility, OERs significantly decrease the amount of money university students are spending per semester.

OERs are changing education as we know it, because of the new possibilities opening for students all over the world. Education in many countries is very expensive; in others, the population lacks financial resources. These issues decrease the percentage of the population that prepares academically at a high level, and it also creates a poverty circle as mentioned here: “Breaking the intergenerational transmission of poverty requires far-reaching actions in the education sector. Widespread poverty affects both students’ performance and their availability to attend school. Low-quality education leads to low income, which in turn perpetuates poverty. Furthermore, low levels of education affect growth through low labor productivity” (Verner 2004). Bringing down the prices for school materials and enrollment so that more people can afford education would help students have a higher chance of being engaged in academic institutions.

“For many students, the added stress of textbooks costs can limit the quality or number of books they buy.”

— Monica Fine

From an outside perspective, it is hard to imagine anyone not seeing the greatness of the idea of OERs. However, if you are part of the publishing world, you probably feel sick at the mention of OERs. Publishers gain hundreds of thousands a year just from university students alone. Of course, they want you to buy the newest edition of the textbook. What is different about the newest edition textbook? A few words and some new pictures. Very rarely does the new edition book have new information (Jokiaho, May, Specht, and Stoyanov 2018).

Examining OERs from a student's perspective, there is little doubt they will be beneficial. For many students, the added stress of textbook costs can limit the quality or number of books they buy. Since OERs are low cost and easily accessible, they allow for students to use the resources that are helpful to them. The variations and multitude of sources lead to enhanced student learning. These benefits have to be addressed because the majority of students can benefit from using OERs.

As part of the Signature Pedagogies Learning Community grant program, my research focused on the differences in teaching strategy of publisher materials (high-cost textbooks, simulations, and access codes) vs. low-cost OERs and home-grown assignments.

The research aimed to investigate the factors that impact students’ perceptions of OERs in higher education. We examine various characteristics to determine what influences the higher education communities’ perception of OERs. First, we investigated individual characteristics of students including student’s monetary benefit, scheduling, sustainability, and adaptation. Next, we investigated course characteristics such as accessibility, cost efficiency, faculty satisfaction, effectiveness in the classroom, and student perception. Finally, we investigated how demographics, such as age, gender, income, family size, household income, and age of user, impact the university communities’ perception/use of OERs.

The sample chosen for this study included students from more than eight universities in the eastern United States. The study consisted of 380 usable surveys. The measures for student perceptions of free or reduced cost materials were adapted from the Attitude Towards Open Educational Resources (ATOER) scale by Mishra, Sharma, Sharma, Singh, and Thakur (2016).

We evaluated student perceptions of:

- The educational experience free or reduced cost materials can provide.
- Their professor in respect to the use of free or reduced cost materials.
- The financial impact free or reduced cost materials may have:
- The overall impact free or reduced cost materials may have.
- Past experiences with free or reduced cost materials.

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Teaching and Measuring Critical Digital Literacy in the College Classroom

Corinne Dalelio; assistant professor, communication, media and culture; Edwards College of Humanities and Fine Arts

Critical digital literacy is an extremely important higher-order thinking skill for students to gain not only for achieving their professional goals, but also for attaining mindfulness in relationships and self-representation. Also, it leads students to become engaged citizens and responsible consumers in today’s media-centric world.

Courses that teach media or digital literacy gain huge instructional advantages by engaging students with the products of their study (Jenkins et al., 2006). Engaging these tools for learning can help students to understand their broader value when used in meaningful ways, and also to embrace new, technology-enabled models for collaboration and professional work. However, it is inappropriate to simply treat it as a “transparent or neutral ‘teaching aid’” (Buckingham, 2007, p. 50). Instead, we need to encourage our students to be more thoughtful about their uses of digital media. Most students today are fully immersed in the online world, and their uses already extend to their informal learning as well (Bulfin and North, 2007). Yet despite their typically frequent use of digital tools, many students fall short of using them for their “full potential of being a competent student, empowered employee, or engaged citizen” (Meyers, Erickson, and Small, 2013, p. 355). For that, they need to break away from the mundane and the typical in order to reflect on a more distanced, thoughtful perspective of technology.

Pangrazio (2016) refers to this kind of reflection as “transcendental critique” and recommends it as an ideal way to achieve critical digital literacy. This specific pedagogical objective is particularly suited to activities that break students away from, rather than integrate, the ways they already use digital tools and media. Pangrazio (2016) offers three main approaches to engaging students in transcendental critique: visualization; critical self-reflection; and interpretation and re-articulation of digital concepts. I will add a fourth category to Pangrazio’s list: digital artifact analysis. In my class, I address each of these categories through the implementation of a weekly “Activity Journal” that requires students to complete, and then reflect on, an activity using online tools.

My research for the Signature Pedagogies Learning Community grant explored signature pedagogies and measures of critical digital literacy in the college classroom. To address the research question, ”What are the best ways to teach and measure critical digital literacy in college students?,” a comparative investigation was conducted across two sections of the course JOUR 350: Interactive Media and Society in the Spring 2019 semester.

The purpose of this research was two-fold: to develop a scale that can be used to measure critical digital literacy among college students; and to determine the best ways of teaching digital literacy at the college level, specifically with respect to aspects of flipped classroom pedagogy. Regardless of the course topic of interest, scholars of flipped classroom techniques have made the case that engaging students with flipped classroom techniques will improve their digital literacy (Stuntz, 2012); critical thinking abilities (Roehl, Reddy, and Shannon, 2013); and metacognition (Yong, Levy, and Lape, 2015), all areas related to the kind of critical digital literacy that I strive to engender through my pedagogical techniques. By specifically looking at the effectiveness of the flipped classroom on the higher order thinking learning outcome of critical digital literacy, the present study aims to advance and test prior assumptions made in the scholarship of teaching and learning on both flipped classroom methodology and critical digital literacy pedagogy, two research areas in their infancy.

The current study was based on two sections of the JOUR 350 course. While the Tuesday class was virtually identical in delivery in both sections, for the Thursday class, students in the flipped section were required to watch one to two video lectures prior to coming to class and complete the homework assignment (Activity Journal) on computers during class.

At the beginning and the end of the semester, all students were given a pre-/post- test to determine if their level of critical digital literacy had increased over the semester. Initial findings suggest there were no significant differences between the groups on post-test scores or level of improvement in critical digital literacy across the semester. However, the students in both sections of the class had improved scores on critical digital literacy measures. Additional analyses of the data collected will continue — including data from future semesters — comparing other factors such as attendance, quiz preparation, activity journals, case studies, and course evaluations with degree of improvement on pre-/post- tests.

An evaluative survey was also given to students in both sections, asking them to specifically assess aspects of the class that were flipped (or not). According to the evaluative survey, students in the flipped section indicated they had a harder time focusing during lectures, but they reported more engagement with activity journals because they were done in class. Overall, students in the flipped section did significantly better and had less variation in their final grades than students in the standard section.

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Using Integrated Problems to Increase Student Understanding and Retention

Drew Budner; assistant professor, chemistry; Gupta College of Science

Instructors of introductory chemistry are increasingly moving away from traditional lecture and adopting more active learning strategies. This includes approaches such as inclusion of in-class problems using simple strategies like clickers, to more involved strategies such as POGIL (a teaching pedagogy known as "Process Oriented Guided Inquiry Learning"), peer teaching, and flipping the classroom. The success of these strategies has been shown in the literature. There is currently a cultural shift occurring to make the chemistry classroom more of an active learning environment where students work together to learn and solve problems.

The general chemistry II course (CHEM 112) is the second semester course of a two-semester general chemistry sequence. This second course builds on the concepts presented in the first semester but focuses on quantum mechanics, atomic and molecular structure, bonding, chemical kinetics, and equilibrium. In an effort to increase students’ understanding and retention of basic chemistry concepts within a general chemistry course, a series of integrated problems were developed to provide continued review of key concepts and incorporation of new material into previous knowledge. In an integrated problems activity, students are asked a series of questions related to a single chemical reaction. As the students work to solve this series of problems, the newer concepts are reviewed along with previous concepts/ideas. Literature has shown that when students solve problems where multiple concepts are combined, their learning has improved.

“Literature has shown that when students solve problems where multiple concepts are combined, their learning has improved.”

—Drew Budner

The comparison was made between students in two flipped class sections. One section held Monday, Wednesday, and Friday (MWF) from 8 – 8:50 a.m. was given class time to complete the integrated problem activities on one day almost weekly. The other section held Tuesday and Thursday (TTH) from 8 – 9:15 a.m. had access to the integrated problem activities, but were not given class time to complete them, and therefore, may not have completed them. Both sections had the same grading expectations and had access to all the same materials.

For this project, the integrated problems were given in the second-semester general chemistry course, but included concepts from both first and second semesters. The increase in student understanding was measured using two assessment activities—a pre-post conceptual test and performance on a departmental written exams.

The comparison was made between students in two flipped class sections. One section held Monday, Wednesday, and Friday (MWF) from 8 – 8:50 a.m. was given class time to complete the integrated problem activities on one day almost weekly. The other section held Tuesday and Thursday (TTH) from 8 – 9:15 a.m. had access to the integrated problem activities, but were not given class time to complete them, and therefore, may not have completed them. Both sections had the same grading expectations and had access to all the same materials.

In this flipped classroom design, students were expected to watch short (10-20 minute) pre-recorded videos, which were developed to introduce students to the course content. The content of the videos was designed to be the same material the author would have provided within a traditional lecture. The links to the videos were available via the course management software (Moodle) for the entire course, and students could watch the videos as many times as they wished. The video lectures allowed for the passive relation of information and rarely involved the solving of mathematical questions.

After watching the lecture videos, students were responsible for completing a six-question quiz administered via the McGraw-Hill Connect platform. The first three questions of the quiz focused on the topic from the previous class period and would be higher order questions or more complicated calculations. The second three questions focused on the newly introduced material and would be simple calculations or straightforward conceptual questions.

The face-to-face portion of the course was divided into two different activities. The class was started with the instructor solving of a complex problem. During the presentation of the solution, the instructor reviewed important information from the lecture and modeled combining multiple concepts in order to arrive at the solution. This was done to give students a example of how to solve problems related to the topic and an opportunity for student so see an example problem worked.

Following the completion of the problem, questions about the material were solicited, either general questions or those related to the quiz. Following this, the students broke into groups where they worked together to complete an in-class activity. The instructor then assumed the role of facilitator and circulated around the room answering questions and offering direction or help to groups as needed. The MWF class was given class time on Fridays to complete the integrated problems.

Assessment results

Students were assigned weekly homework with ALEKS (Assessment and Learning in Knowledge Spaces). ALEKS is an adaptive learning platform. A student was considered to have learned the topic after consistently providing correct solutions to questions related to the topic. The students were also periodically reevaluated on the topics they have learned, and if a student did not correctly provide a solution during one of these knowledge checks, the topic was added to the list of topics to learn.
Signature Pedagogies

Using Integrated Problems to Increase Student Understanding and Retention

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When looking at the amount of the time spent on the ALEKS — which because of the complexity and length of the weekly objectives is a true measure of time spent working on chemistry outside of class — there is a significant difference between the percent of ALEKS completed and the total time spent in ALEKS between the TTH and MWF sections. While there is not a significant impact on final grades, the use of these integrated problems appears to help students improve the quality of time on task. Students being able to achieve similar scores while spending less time on tasks indicates that these integrated problems improve students’ knowledge of key concepts.

Over the course of the semester, there were a total of four exams: three unit exams and a cumulative final exam. The exams were written by a group of faculty members teaching various sections. The final exam was a cumulative final consisting of 25 multiple-choice questions and seven more-involved calculations.

In general, the average on the faculty-written exams declined over the course of the semester. This has been the case at CCU every semester. However, with the exception of the first exam, the TTH section had averages above that of the MWF section. One possibility for the lower performance of the TTH section on the first exam was students getting familiar with the flipped classroom environment. There was a greater proportion of students within the MWF section that completed the first semester course using a flipped classroom design.

It is clear that as the semester continued, the distance between the average performances on the exams between the TTH and MWF section increases. Additionally, the standard deviation of the TTH section decreases as compared to the standard deviation of the MWF section. When looking at the individual scores, this change in the standard deviation is primarily driven by the decrease in very low scores in the TTH section compared to the MWF. When looking at the average final grade between the two sections, there does not appear to be any difference.

When the results of the pre- and post-concept tests are examined, it is clear that both the TTH and MWF sections showed an improvement in the overall score following the semester. It is also clear that following the course, the students in both sections struggled with some key fundamental chemical concepts. However, the students in the TTH section showed a slightly larger improvement over the semester.

One important consideration is that while the instructor emphasized the importance of the concept test to gauge the students’ understanding, the completion of the test was not included in the course grade, and it was clear from the observation of the sections and the coding of the test that students did not take the assessment as seriously as was intended. While the scores do improve over the semester, both the low post-test score and the small change is impacted by the student motivation in addition to lingering misconceptions.

Student impressions

Students impressions and feedback on the overall course as well as the integrated problems were collected using two different surveys. The first was an anonymous survey collected using Moodle, but the primary method for gathering these impressions was using a course survey completed at the end of the semester. From this survey, it was clear that students in both sections used the integrated problems. However, the focus of the use was very different. The few students in the TTH section who stated that they completed some of the activities provided the following comments:

- “Helped me study for the exam.”
- “I did not feel as though I was able to solve them without assistance from Dr. Budner in many cases. If the solution had been accessible, I may have attempted them more often.”
- “My group didn’t complete them all, but we did some because we wanted to give ourselves more of a challenge.”

For these students, it was clear that they used these problems as a method to study for the exam, and as such only worked on these activities in the days preceding the exam. For these students, the impact was up to three times during the semester. However, the comments from the students in the MWF section provide a slightly different impression of these activities:

- “I got the opportunity to do the integrated problems in class, and it helped me remember information from different topics.”
- “They really made it challenging, but if you could figure out the problems the test was a breeze.”
- “Integrated problems helped bring old topics to life, so we had to use previous knowledge to complete the problems. This helped go over material that might have been forgotten, and reiterated them in our minds.”

It appears that these students focused on the impact of these integrated problems to help them learn the material and put the new concepts into context of their understanding. Students’ regular exposure to these integrated problems appeared to not only improve student performance in the current course, but strengthen their understanding of basic chemical concepts which is exactly what these activities were designed to do.

Conclusion

The inclusion of a series of integrated problem in-class activities within a second semester general chemistry course delivered in a flipped—classroom style was evaluated for improvements in student learning. While the results did not show statistically significant improvements, there is evidence that the inclusion of these activities does improve student learning and performance. There also appears to be a difference in how students view these activities based on how the integrated problems are available to the students. When there is an intentional inclusion of the problems, students recognize that the problems aid their learning more in comparison to an additional study aid. The use of these types of problems, which show evidence of improving student performance, will allow more students to successfully complete the general chemistry sequence, and perhaps have a better chemical foundation which will improve performance in other classes.

References


Signature Pedagogies: The Faculty Perspective
Continued from Page 1.

“I now look at signature pedagogies differently. I have begun to be clearer in my thinking about what I’m doing in the classroom and why. I am trying to be very intentional in my teaching and course design.”
—Drew Budner

“I was able to meet my goals during my time with my learning community. I met and worked with colleagues who shared resources, ideas, and insights about classroom-based research. We supported each other during writing exercises and provided useful feedback. I watched my assignment evolve over the course of the project into a qualitatively richer activity.”
—Adriane Sheffield

“I now have a better understanding of conducting research in my own course and its intricacies. The learning community was particularly supportive to this goal as we shared experiences during our discussions and meetings.”
—Heather Hagan

“This yearlong collaboration certainly reminded me that teaching is worth researching and writing about, even though, in the past, I have been discouraged from pursuing pedagogy-related projects as they are presumably not as “rigorous” or “worthy” as other scholarship.”
—Ina Seethaler

“What was most helpful to me was seeing the presentations from other content areas and learning what other disciplines find important. It helped me understand some things from other colleges and gave me things to think about in my own discipline. For example, Clayton’s geography project made me think about the way graphics are used in special education and how the graphics I use on my CAPS might affect what the viewer learns about a topic.”
—Rhonda Miller

A Picture is Worth a Thousand Words: Strategic Figures in Physical Geography
Continued from Page 3.

and the results will be compared to the pretest. I hope my findings will give me a sense of student effectiveness in identifying important figures in the reading. These findings should allow me to optimize my in-class instruction to enhance in-class discussion.

If students can improve identification of important figures in an introductory physical geography textbook, it should allow instructors to use an optimized set of figures for in-class instruction, which should enhance classroom discussion and result in more in-depth analysis and thinking. This has potential to provide instructors with “teaching guides” that convey the important concepts of geography and present it in a fashion that is more engaging to the students.

If these findings are positive, the results extend beyond physical geography and apply to all subjects and texts where figures provide the backbone of the content. Students who become adept at identifying the important components of images are likely to excel, regardless of discipline.

Distance Versus Face-to-Face Supervision of Pre-Service Special Educators
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References


The Use of Content Acquisition Podcasts and Feedback for Teacher Development
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References


Factors Impacting the Perception of Open Educational Resources in Higher Education

Continued from Page 6.

To examine the students’ perception of OERs, several types of analysis were conducted. First, descriptive statistics were computed. Then, the Pearson correlations were examined between the dependent variable and each of the five independent variables. Finally, a multiple regression analysis was used to test the hypothesized relationships.

The results suggest that faculty support of OERs, connectivity to the course, students perception of quality teaching, age, and gender are the most important factors contributing to the students’ perception of open educational course materials.

References


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April 9, 2020
CeTEAL Stress Awareness Day

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CeTEAL News was created to share information with faculty and to highlight faculty accomplishments, activities, and research. If you are interested in contributing to the newsletter or have news you would like to share, please contact Tracy Gaskin at cetealnews@coastal.edu.

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