This classroom inquiry project attempted to answer the following research question: “How, if at all, do literature circles serve as a productive learning experience for higher education students in large discussion-based classes?” This inquiry was conducted in two undergraduate education courses of 50 students across 2 quarters. Demographically, the students represented undergraduates majoring or minoring in education, and the majority of the students were female, White, and Asian.

Data about students’ learning experiences were provided by mid-quarter interviews conducted by an outside instructional consultant. Analysis of self-reported student data from the two groups of students showed that student engagement in and perceived learning from literature circles was greater in the second quarter than the first. These differences in student engagement and perceived learning may have occurred due to the pedagogical modifications that the instructor made as a result of quarterly student feedback. This inquiry has implications related to 1) the pedagogy of structuring group reading work and 2) the usefulness of literature circles at the higher education level.

This study aimed to understand teacher candidates’ expectations from initial teacher preparation programs and to explore their views on having their own social emotional needs addressed in the process. It was situated within the Elementary Teacher Education Program (ELTEP) at the University of Washington, Seattle. To encourage participation of the teacher candidates, who are at the halfway mark of their one year program, they were given a questionnaire containing six open ended questions. Qualitative analysis was used to analyze the responses of the teacher candidates. These responses were coded into categories allowing distinct themes to emerge from the data. The data reflects a wide range in the responses both in terms of expectations of the teacher candidates from the teacher preparation programs and teacher candidates’ perception of their own social-emotional needs. The themes reflecting the expectations from teacher preparation programs were categorized into – Teaching as a Skill, Teaching for the Real World, Teaching as Transformative, and Teaching as Reflective Practice. While analyzing the responses on teacher candidates’ perception of their own social emotional needs, the themes identified were – Teacher as Model, Teacher as Mother, and Teacher as Professional. These responses reflect the struggle of teacher candidates to position themselves in terms of the predominant discourses of teacher status in society, the influence of the teacher preparation program, and their own nuanced understanding of the issue. The overarching argument posed in the presentation is that it is crucial to address teachers’ own identities so that the program encourages teachers to reflect upon their own personal socialization. This push for reflective practice is important as it is a tool required to meet the ideals of being a community teacher, teaching for social justice, teaching against the grain, and preparing teachers for diverse learners.
#3

**Reflective Learning: How Teaching Metacognition Enables Students to Learn More Effectively**

Jennifer Eidum Zinchuk, English

Although scholarship in teaching and learning has a long history of trying to understand and assess learning transfer across disciplines, it has received considerable attention writing studies over the past twenty years. Most recently, composition scholars have critically examined the role of first-year composition courses in providing students with the transferable skills they need to traverse academic writing communities throughout the university (Downs and Wardle 2007, Smit 2004). Many of these studies have pointed to the important role metacognition plays in students’ ability to transfer learning across disciplines (Beaufort 2007, Negretti and Kuteeva 2011, Nelms and Dively 2007, Reiff and Bawarshi 2011). My research seeks to understand how explicitly teaching metacognitive strategies and learning vocabulary enables students to become better learners later.

In this poster presentation, I will present preliminary results from my dissertation work, which analyzes how students utilize metacognitive strategies and learning vocabulary taught during the Early Fall Start English 108 course. During EFS 2013, over 300 first year students enrolled in this course and over 80% of those students came from outside the United States. Although anecdotal evidence has shown that all students—domestic and international—seem to have become better learners after taking English 108, my work seeks to articulate what they are doing and how it can be measured. During this poster presentation, I will focus on 3 components of my work: 1) what metacognition looks like in written and spoken narratives and how one might assess it, 2) the benefits of metacognitive practices such as self-reflection, self-assessment, and self-advocacy in learning and how these practices can help students become more effective learners throughout their learning careers, and finally, 3) I will present teaching activities that instructors from all disciplines may use to foster students’ metacognitive skills in their classrooms.

---

#4

**Composition Students Investigate School-Based Service Learning**

Lily Campbell, English

A number of service learning English courses at UW place students into classrooms at high-need primary and secondary schools in Seattle. These include English 121: Composition, Social Issues, English 298: The Community Literacy Program, and English 471: Teaching Writing. While UW students attend orientations prior to their service, K-12 teachers may receive less support with integrating volunteers into their classes. This project involved students in an English 121 course in answering the question: How can we better understand the various aims of these partnerships (for students, for K-12 teachers, and for UW faculty) and provide public school teachers with resources to help utilize student volunteers?

To answer this question, my students and I gathered accounts from various participants in school-based service-learning placements. I surveyed and assembled focus groups of students who have participated in any of school-based service-learning courses in the English department. I also communicated with UW English faculty to better understand the ways they frame school-based service learning. English 121 students identified their goals for school-based service learning and interviewed K-12 teachers about their aims for volunteers. Students’ final projects worked to design curriculum for their service sites that takes advantage of volunteer participation.
Students in English 121 wrote regular critical reflections about their service learning throughout the quarter. These evidence the ways that participating in field-based research and contributing materials to their organization gave students real stakes to their classroom work and expanded their sense of involvement at their organizations. In addition, this research was translated into resources for public school teachers and administrators involved in service partnerships. These materials synthesize results from focus groups, surveys, and student’s field research. They include a summary of student volunteer perspectives, informational support materials for utilizing volunteers and suggestions for curriculum and classroom activities that take advantage of volunteer participation.

#5
360 Assessment of Library Instruction for the University of Washington Expository Writing Program
Kali Stoehr and Caitlan Maxwell, Information School

The University of Washington Libraries Teaching Team is currently working on a “360 assessment” of our instruction sessions for the Expository Writing Program (EWP), which include freshman level expository writing classes. In our research we strive to understand how library instruction impacts student learning and integrates into the EWP curriculum. The “360 assessment” plan includes gathering assessment data from students, instructors and librarians in the form of post-library session surveys. Our results will be acquired and consolidated by the presentation date and we hope to learn invaluable information about the topics and methods most most effective in undergraduate instruction. The data gathered from the student, instructor, and librarian surveys will influence how we teach and coordinate instruction and allow us to design best practices for teaching undergraduate English writing classes.

#6
Teaching the Realms of Knowing: Framing Thinking in the Classroom
Deborah L. Pierce, UW Libraries

“No problem can be solved from the same level of consciousness that created it.” – Albert Einstein

How might we positively influence the future by teaching our youth to meet the daunting challenges and opportunities that face us today? How might we help them achieve new and different levels of thinking? How can we cultivate creative, critical, and global thinking in our classrooms?

I find the most important elements of mentoring young people, whether in a formal classroom setting or over a cup of tea, are those which help them develop life-long curiosity, to understand themselves and others, to discover their own voices, and to acquire a passion for possibility. To cultivate this kind of development, I created a model I call The Realms of Knowing, which has been applied in various settings including the courses I teach in Honors and General Studies and in my research strategy, tutoring, and mentoring sessions. Some of my colleagues have also used it in K-12 classrooms and graduate seminars and have found it readily applies to any subject and helps to foster interdisciplinary discourse. It has been successfully used to guide classroom discussions, served as a framework for research projects and assignments, and has helped cultivate global thinking within and between disciplines. I have noted changes in student thinking and understanding through observing classroom activities based on the model, through monitoring students’ research processes and progression, and through reading assignments and reflective writings. What a joy it is to see the unfolding and excitement of young minds!
This poster will present the model along with a variety of teaching/learning applications and distill the experiences of the instructors who have successfully used it in the classroom.

#7
Exploring Research in Communication and Social Sciences: Building Classroom Community and Student Confidence Through Teaching Research
Verletta Kern, UW Libraries; Connie Montgomery, UW Evening Degree & Educational Outreach

The Undergraduate Evening Degree Program (EDP) consists of a student population with varying occupations, diverse ethnic and socio-economic backgrounds, and a vast range of ages. The average age of an EDP student is around 32 with ages ranging from 21 to 80. While these adult learners are extremely motivated, the idea of conducting research can be intimidating. Over the past four years, EDP advisers have developed a relationship with the UW Libraries exploring the question of how to increase student confidence in their research abilities and enhance research skills. The result was the development of a three-credit course called Exploring Research in Communication and the Social Sciences co-taught by an EDP academic adviser and a librarian. The course is designed to build upon concepts weekly by introducing students to the whole research process, from developing a research question to performing a mini-literature review in the form an annotated bibliography. Critical thinking skills are explored in critiquing research articles and selecting appropriate methods to research a topic of the student’s choosing. Students learn about the research process from faculty and Undergraduate Research Symposium peer guest lecturers. The course culminates in a final annotated bibliography and poster presentation. Student learning is assessed through a course pre and post test, an in-class focus group at the end of the quarter, and student evaluations. Post-tests show an increase in students’ confidence in their research abilities. Several students commented that this is a class all students should be required to take. One student expanded her research topic and presented at the Undergraduate Research Symposium. We believe the success of this course lies in the cumulative design and accompanying in-class activities, allowing students to learn from each other while reinforcing key concepts. We look forward to continuing to evolve the course to meet student learning needs.

#8
Transferring Principles of Metacognition and Alignment to Different Learning Environments
Benjamin Hole, Philosophy/Odegaard Writing & Research Center; Matthew Davidsonson, College of Education / Odegaard Writing & Research Center; Ronald Keller, Philosophy / Odegaard Writing & Research Center; Reagan Keller, Odegaard Writing & Research Center

The culture of instruction is shifting to student-based active learning. Recent literature suggests that alignment between (1) learning objectives, (2) pedagogy, and (3) assessment, promotes metacognition for active long-term learning. When this model is used to structure different learning environments, such as TA quiz sections and tutoring sessions, what are the anticipated impacts on student learning?

By “learning objectives” we mean however you want learners to change. By “pedagogy” we mean whatever you design for learning. By “assessment” we mean however you know if learners have changed and how to adjust learning objectives and pedagogy accordingly.

We experimented with transferring these principles into the Philosophy Department’s “teaching seminar” for new TAs and into tutor training and professional development at the Philosophy and Odegaard Writing and Research Centers. The Philosophy Department assessed these results
quantitatively and qualitatively through student, tutor and TA testimonials. The OWRC assessed results qualitatively via tutor workshops and feedback on sessions.

Our preliminary findings suggest that developing strategies for aligning learning objectives, pedagogy, and assessment, promotes the metacognitive strategies necessary for active long-term learning. For example, well-aligned tutoring sessions empowers students to structure their own learning processes and negotiate their paper writing priorities, practice strategies to meet those objectives, and incorporate feedback strategically. Many students transfer these strategies broadly outside of tutoring sessions. Also, TAs and tutors feel more comfortable negotiating between directive and non-directive pedagogy. The greater implication is to foster a culture of active long-term learners.

The simplicity and flexibility of this model for alignment makes it highly transferrable. It also accounts for the complex interrelatedness of the different components of the learning environment and how situational factors influence them. These strengths make the model especially practical for shorter learning environments. The primary limitation of this study is that it requires further research.

#9
Teaching Writing for Impact Factor: The UC to UW
Stephen Sadlier, UW International & English Language Programs; Cristina Arancibia, Language & Literature Department, Pontifical Catholic University of Chile

Across the globe, a knowledge economy push for citable research locates junior scholars in intensified competition early in their careers. As prestige journals principally publish manuscripts in English, many international scholars are at an added disadvantage. Furthermore, pre-dissertation publishing tendencies affect researchers who graduate from or expect to teach in global south universities where nascent research communities face administrative demand for higher rankings, fueled by what one student termed, “impact factor.” The present action research academic literacy project began when, as a visiting professor, Stephen’s academic literacy seminars intersected with Cristina’s at the Catholic University of Chile (UC). Our combined inquiry has asked: how do non-native English speaking graduate students navigate the relationships needed to produce and publish high impact research prior to graduation? This initial phase of the project weaves together testimonials on publishing successes and challenges faced by UC and University of Washington doctoral candidates. Discursive analysis and participant observation portraiture into the formal and informal spaces of student learning reveal the importance of advisor and peer relationships for successful steering through knowledge-production processes. Students who learn to write for impact factor do so with the help of others. Our preliminary findings suggest that students approach writing for impact factor in three ways: deductive study of dominant-text genre moves, critique of normative writing practices and play and performativity related to academic writing. The three findings will inform follow-on steps, involving materials development and a team-taught pilot course for science faculty members to support their students’ writing. We will track the effectiveness of the findings and pilot course outcomes with ongoing interviews and observations with professors, their advisees and our first group of doctoral candidate informants progressing toward the dissertation and beyond.

#10
Digital History in a Course on Global Communism
Glennys Young, History & International Studies
Can involving students in the production of digital history—in this case, websites designed to answer a specific question—be useful in teaching students skills of historical analysis and stoking their interest in historical research in general? I chose to explore this question in my fall quarter (2013) course, “History of Communism.” In small groups of three to four, students chose a topic related to the course and did the research to produce websites on such topics as the Lenin Statue in Fremont, the Canwell Committee, and Filipino-American labor activists. Students took considerable initiative in locating primary sources, such as working in the University Library’s Special Collections. By having students write reflection papers in which they discussed what they learned and how they overcame obstacles to answering research questions, I learned that there were unanticipated benefits to the assignment. Not only did many students get excited about working with primary sources, especially in archives. By getting to know other group members, some students felt a deeper sense of belonging to the University, and/or approached their courses with less anxiety about their abilities. Not only does my experience suggest the value of such projects for student learning, it also invites us to consider how such projects can be designed more effectively to that end, and combined with other assignments to develop students’ creativity.

#11

Multi-Modal Learning: Tegrity Lesson-Planning for the Humanities and Social Sciences
Rachel Arteaga and Mandy Hobmeier, English; Peter Wallis, UW-IT & College of Education; Rachel Shields and AJ Burgin, English

Emergent technologies present opportunities for multi-modal learning and hybridized pedagogical spaces. Flipped classrooms, defined as integrated face-to-face and online learning, have gained popularity as a method of content delivery; they have been primarily used for exam-based large lecture formats. Instructors use applications such as Tegrity, a voice recording and screen capture platform, to create the online components of these lessons, which are typically information-based 60 minute segments. Working collaboratively as graduate student instructors in the interdisciplinary Teaching with Technology Graduate Interest Group, sponsored by the Simpson Center for the Humanities, we started thinking beyond the traditional usage of such platforms. Noting that Tegrity allows instructors to create original learning content that can accommodate a variety of student needs, our research question took shape around what we view as a significant distinction between large lectures and small writing-intensive classroom settings. How can Tegrity technology be utilized specifically to support the emphasis these courses place on scaffolded and interactive skill development rather than information assimilation? Our presenters experimented with Tegrity as a method of multi-modal lesson-planning. To assess the impact of our project on student learning, we are using the analytics section of the Canvas online classroom management system and informal student surveys. These methods provide quantitative information on student participation and qualitative feedback on engagement. For example, we have learned that length of recording is correlated to student interest. At this point, our research indicates that there are wide-ranging implications for instruction at the University of Washington, where Tegrity is immediately accessible to instructors through its integration into Canvas. This poster will introduce the tool, share best practices, and offer concrete models for adapting lesson plans for the Humanities and Social Sciences, thinking toward optimized student engagement and interactivity.
Students often struggle to produce their own prompts for short story writing. In ENGL 284 (Beginning Short Story Writing) we collaborated to run an active 80 minute class session in which students analyzed the writing techniques within short stories individually, and then generated prompts together based on those annotations. We utilized Google docs to share three stories with the class in a format they could all highlight and annotate. Students then brainstormed in groups of two and three to produce writing prompts for themselves.

We pursued group digital annotation in order to test the practicality of digital annotation for general student use as well as gauge the benefits of sharing individual close readings to developing collaborative assignments. The test revealed that students are, as a group, able to rapidly produce a high volume of insightful annotations, useful to themselves and other students. We found that this formed an excellent preparation for producing writing prompts, which the students quickly posted in Canvas discussions after filling out an assignment template and a blank rubric. We were able to assess student comprehension of the readings by looking at their individual annotations and the effectiveness of their collaboration, revealed by the complexity of the resulting writing prompts in which students clearly borrowed and combined analyses from the annotated documents. Students chose a prompt generated by the class to complete individually at home and turn in later for a grade based on the peer-created rubrics.

We hope this initial work will provide a starting point for others. Collaborative annotation may be useful in generating other writing prompts, or overcoming other difficulties in the writing process. Further refinement is possible, and courses which regularly use collaborative writing and annotation assignments may increase efficiencies in the process. Students, working together digitally, can produce thoughtful work in a short period of time, but we do not yet know the best methods of teaching toward this end.

The growing use of technology during class by students is a concern for many college instructors, who view mobile technology and, especially, mobile access to social media as a classroom distraction. While the personal use of smartphones during class can certainly be distracting, the reality is that smartphones and the access they offer to a vast array of apps are here to stay and are very much a part of every student's daily rituals.

But there may be ways of employing these technologies as learning tools so that students can complete assignments by using the very technology that is a part of their everyday life. Social media can also serve as active and inclusive tools in the classroom, especially for students who may hesitate to participate in conventional ways. Students can also rethink their use of mobile and social media technologies and can learn to utilize them for resource-enhancement, media-integrated assignment preparation and in-class communication and participation.

I have used variety of mobile technologies and new media tools to enhance classroom participation in and outside of the classroom in classes that I have thought the past three years. The classes were for 25-40 students and were designed for undergraduates who were all
Communication majors.

The boundaries of mobile technology use in the classroom are still in the making. In this vein, it is crucial to ask students every academic year about their individual experiences of learning with technology as the content and the use of these technologies change so rapidly. What type of technology based classroom activities enhance or hinder their learning? What has these technologies added to the classroom learning environment? Do they have suggestions for technologies they use for an in-class activity? I believe that an on-going conversation will allow both instructors and students to contemplate about how to be mindful and creative about technology use in the college classroom.

#14
Findings of the 2013 EDUCAUSE Center for Applied Research
Cara Giacomini, Peter Wallis, and Henry Lyle, UW-IT

This poster reports on the devices UW undergraduate students use to support their academic success, including laptops, desktops, tablets, smartphones, and e-readers. Data for the poster are drawn from the 2013 Undergraduate Student Technology Study conducted by the EDUCAUSE Center for Applied research (ECAR). The ECAR survey provides a valuable opportunity for the UW community to learn about the types of technology students use, how they use the technology, and for what purposes. One compelling survey finding is that students use Smartphones to enhance their learning in the classroom despite the fact that faculty strongly discourage the use of these devices. These data, particularly in combination with information about specific tasks that students report carrying out with phones in the classroom, provides a useful glimpse into how students use their own devices to increase their learning.

The ECAR student survey currently reaches nearly 250 institutions. UW has participated in the study since 2009. The poster also includes information on accessing a detailed benchmark report that compares UW to peers around the country on device use and a number of other technology measures. Staff from UW-IT will be present to discuss the data more fully.

#15
Learning, Technology, and the Digital Text: UW-IT’s eTextbook pilot
Cara Giacomini, Peter Wallis, and Henry Lyle, UW-IT

Between Spring Quarter 2012 and Spring Quarter, 2013, UW-IT piloted two eTextbook platforms in a wide range of courses across all three campuses, reaching almost 2,000 students in a variety of disciplines.

The study, which employed a broad student survey, usage metrics, and faculty interviews, contributed to an understanding of what students and faculty need and can use in online textbook platforms. A comparison of the two platforms and more general information about student preferences and interests help us to understand how both traditional and digital textbooks are part of the learning ecosystem. Findings highlight student needs for low price and high mobility; ongoing accessibility concerns; and informative patterns of reading, or not reading, in the student population.

These pilot findings help describe complexities and values in the UW student experience, and can inform faculty, staff, and anyone concerned with the adoption or use of technology tools, inside
and outside of the classroom. These findings also continue to inform new research today, as UW-IT engages with a variety of platforms for online content.

#16 – CANCELED

#17

Examining the Pros and Cons of Technology: The Students’ Perspective

Anna C. Schroeder, Alexandra L. Perkins, Lauren Pecaro, Thao Nguyen, Michael K. Meechan, Anna J. MacCamy, Yifan Lu, and Edwina Choung, Chemistry

We aim to give an overview, analysis, and perspective on the use of technology in the classroom. Specifically, we will present some of the most significant advantages and disadvantages of recent technological developments at the University of Washington, including online virtual office hours, mini lectures, online discussion boards, course modules, flipped classroom concepts, and online homework. As students, we feel it is important to provide our perspective on the effectiveness and total value of these teaching tools. We have participated in a redesigned Organic Chemistry course (Chem 237A) with a maximum enrollment of 350 undergraduate students. Comparison of scores on concept and application based exam questions from this year and those from previous years revealed a positive impact of the current course design. However, comparison of scores from exam questions based upon material presented during live lectures versus online recordings suggests that live lectures were more effective for learning. Our findings would support using these online tools as valuable adjunct rather than as the primary teaching method for the course.

#18

Using Technology Outside the Classroom to Enhance Teaching

Andrew Boydston, Chemistry

I aimed to develop methods for teaching introductory organic chemistry that would enable efficient student learning outside the classroom in order to enhance the “live” in-class discussions. Specifically, I wanted to use Canvas and online homework to introduce fundamentals, technical skills, and simple conventions necessary for more in-depth analysis and applications-oriented problems. The course included 327 undergraduate students and 4 graduate TAs. I found that students were quick to adapt to the technology, made use of it frequently, and were much more engaged during the live lectures. The effectiveness of the pedagogical switch was assessed both qualitatively and quantitatively. Aspects of student engagement such as frequency and depth of questions, requests for applications-relevant information and examples, and willingness to propose ideas and strategies for problem-solving were considered qualitatively based upon my impression of the student activity in comparison with previous years of teaching the same course. I collected per-problem data on each exam problem, to assess students’ ability to tackle concept- and applications-based problems that were previously very challenging for students in this course. Student performance on similar styles of exam questions were compared quantitatively between the current and previous years, and in general it was found that the pedagogical switch resulted in a discernable improvement in challenging questions in which concepts had to be applied within a new context. Additionally, students were asked to provide numerical scoring on how influential it was to have the new aspects of the course included, which provides a semi-quantitative analysis. I can foresee this becoming a model platform for other faculty in my department to facilitate expert-level discussions in the classroom setting.
#19

*Student “Reaction” to a Flipped Introductory Chemistry Class*

Colleen Craig, Chemistry

Introduction to General Chemistry (CHEM 110) is a 3.0 credit course offered in the fall quarter that prepares students with limited exposure to chemistry for the standard general chemistry sequence (CHEM 142/152/162). Approximately 200 students enroll in the lone CHEM 110 section every fall. It has traditionally been taught in a standard lecture approach in three weekly class meetings, with the weekly discussion section reserved for group exercises. Through my participation in the 2013 Teaching with Technology Fellows program, I endeavored to invert this structure for my Fall 2013 CHEM 110 course, with the goal of promoting co-construction of knowledge among the students and to develop a sense of community in the class. I employed the Canvas LMS, Catalyst WebQs, and the Panopto lecture capture system to deliver a mixture of online and on-premise learning. The main concepts of the course were introduced asynchronously in 1) pre-lecture quizzes over textbook reading assignments, 2) the online learning system ALEKS, and 3) pre-lecture videos recorded that I recorded. About once a week, class time was devoted to synthesizing these concepts into larger ideas via case-study group activities that the TAs and I facilitated. Preliminary feedback from student evaluation comment sheets and a more detailed course survey I composed indicate that a significant fraction of the students enjoyed the case study activities, and credited the activities with helping them understand the material more deeply. The results of this survey will be presented in detail. In addition, a comparison of exam and ALEKS performance in Fall 2013 CHEM 110 and Fall 2012 CHEM 110—which was taught in a lecture-only format—will be presented.

#20

*Classroom Assessments that Make a Difference for Faculty and Students*

Jim Borgford-Parnell and Ryan Campbell, Center for Engineering Learning & Teaching

At the Center for Engineering Learning & Teaching (CELT), our instructional development mission is to improve student learning by helping faculty members implement research-based best teaching practices. However, best practices that are developed in one educational setting won’t necessarily work in new contexts without appropriate adaptation, and adaptation requires local formative assessment data. At CELT, we have developed a formative assessment data management and reporting process that links mid-quarter, end-of-quarter, and past/next quarter data. This process enables effective instructional consultations and targeted teaching/course improvements. Research in the wider literature has shown that faculty who solicit mid-quarter feedback from their students achieve higher end-of-quarter ratings, especially when this feedback is coupled with expert consultation. Improved course ratings are important outcomes, but the real benefits can be improved learning, improved student and professor interactions, students taking assessments seriously and assuming more responsibility for their own learning, and professors viewing instructional development as an on-going, continuous improvement process that can fit into their busy academic lives. Our faculty clients report substantial benefit from this process, and when over 3500 of their students were surveyed in more than 111 courses that have been assessed over the past several years, 92% of those students reported seeing teaching improvement after CELT’s involvement.
Although reflection – assigning meaning to prior experiences and determining how the meaning guides future activity – is widely recognized as important for learning, finding ways to appropriately and effectively support student reflection can be challenging. And yet, there are educators who have figure it out – educators who have developed strategies for supporting reflection. We contend that we need to learn from such educators. With support from a recently funded grant, the Center for Engineering Teaching & Learning is starting to identify and work with engineering educators from twelve campuses to map their approaches to supporting reflection. In this first phase of our project, we will be gathering data on reflective practices through interviews. We will then develop campus-specific guides to reflective practices as a way to provide information back to the educators on a campus in order to catalyze greater use of reflective practices. The long-run significance of this work is this: A better understanding of such practices will provide a basis for recommending reflection practices to specific teaching situations and conducting add-on scholarship of teaching and learning studies to explore the results of particular practices. By being a part of this symposium, we look forward to sharing our project with others and also hearing their strategies for supporting student reflection.

Gender gaps in the sciences have received significant attention recently. An issue of Nature, published last year, focused on the heavy amount of discrimination still faced by females in academia. Much of this discrimination stems from individuals who started their academic careers when the gender gap was much more visible. The continuation of this gap is likely if current students graduate their undergraduate experience with gendered biases. We investigated undergraduate perceptions of their peers to test for a gender bias in who is discerned as being a particularly strong student.

We performed our research in a large undergraduate biology class, comprised mostly of freshman and sophomores at the University of Washington. Students were asked at different points throughout the quarter to identify other students who they felt were particularly strong class material. We find no gap in perception of gender at the beginning of the class. However, as the quarter progresses, males become more likely than females to be nominated as knowing the material well.

This research has important implications for achieving gender equality in the sciences. The overall trend in this classroom implies that many students left this class with the perceived experience that male students, on average, are more knowledgeable than female students. As the future wave of scientists, innovators, and policy makers, breeding a potential implicit bias may be dangerous in perpetuating a future gender gap in the sciences. Replicating this study in other classrooms, as well as understanding what underlies the witnessed phenomenon, will be important to fully understand the implications of this work.
Although writing is an imperative skill for both academic and professional engineering success, student motivation to master and perform engineering writing is often considered problematically low. Engineering students report disliking writing, distrusting their writing teachers, and finding assignments demotivating. The absence of an evidence-based understanding of the motivation of engineering writing students forces instructors navigate their class’ motivation solely through intuition and assumptions, risking the further alienation of their students.

In order to empower professors to cultivate and positively influence student motivation, we must first better understand what factors influence student motivation in engineering writing. Specifically, we’d like to explore a cluster of questions central to engineering writing education, for which the answer is typically assumed by instructors: a) What attitudes about writing and concepts of engineering do students bring to their technical communication classes? b) Is student motivation increased by underscoring future importance of writing, by designing more authentic assignments, and/or by encouraging social or intrinsic rewards? c) Looking forward, how do students think that professors might better motivate students?

To answer these questions, we are developing a program to gather student motivation data, embedded within a motivation workshop that we will present in engineering writing classes comprised of sophomores, juniors, and seniors. We will also interview selected students individually. From this data, we will provide an evidence-based portrait of engineering writing students’ motivation and influential experiences. We will distill these results into student personas, in order to accelerate the translation of student motivation data to engineering education practice by faculty. Through this, we hope to gently complicate common faculty assumptions about engineering student motivation, and foster a more student-centered approach to motivating learning in engineering writing classes.

Over the last five to ten years there has been a national movement in biology education to move away from teaching college students more and more content and instead focus on teaching core principles and concepts. One of the documents that came out of this effort is called Vision and Change in Undergraduate Biology Education. Vision and Change outlined five core concepts that are intended to guide undergraduate biology education. We have taken these general recommendations and created a Vision and Change BioCore Guide—a set of general principles and specific statements that expand upon the core concepts, creating a framework that biology departments can use to align their curricula with the goals of Vision and Change. We used a grassroots approach to generate the BioCore Guide, beginning with faculty ideas as the basis for an iterative process that incorporated feedback from over 240 biologists and biology educators at a diverse range of academic institutions throughout the U.S. The final validation step in this process demonstrated strong national consensus, with over 90% of respondents agreeing with the importance and scientific accuracy of the statements. It is our hope that the BioCore Guide will serve as an agent of change for biology departments as we move towards transforming undergraduate biology education.
#25

Gender Gaps in Achievement and Participation in Introductory Biology Classrooms
Sarah Eddy, Biology

Although gender gaps have been a major concern in male dominated STEM disciplines such as physics and engineering, the numerical dominance of female student in biology has supported the assumption that gender disparities do not exist at the undergraduate level in this field. Using data from 23 large introductory biology classes, we examine two measures of gender disparity in biology: academic achievement and participation in whole-class discussions. We found that females consistently under-perform on exams compared to males with similar overall college GPAs. In addition, although females on average represent 60% of the students in these courses, their voices make up less than 40% of those heard responding to instructor-posed questions to the class, one of the most common ways of engaging students in large lectures. Based on these data, we propose that despite numerical dominance of females, gender disparities remain an issue in introductory biology classrooms. For student retention and achievement in biology to be truly merit-based (rather than influenced by gender identity), we need to develop strategies to equalize the opportunities of students of different genders to practice the skills they need to excel.

#26

New Concept Inventories for Measuring How Biology Undergraduates Understand Evolution
Rebecca Price, Interdisciplinary Arts & Sciences, UW Bothell; The EvoCl Toolkit Working Group

Teaching evolution effectively continues to be a challenge. Until recently, researchers have concentrated on improving students’ conceptions of natural selection, but natural selection is only one part of evolution. My colleagues and I have developed three instruments to measure what students understand about other evolutionary processes: (1) the EvoDevo Concept Inventory measures how well undergraduate biology majors understand the connections between the changes that individuals undergo during development and evolution; (2) the Genetic Drift Inventory measures how upper division biology majors understand the effects of random changes in the frequency of a trait on evolution; and (3) the Dominance Concept Inventory measures how well biology majors understand the way dominant versions of genes evolve. In this poster, I summarize the three instruments and review our stringent validation criteria that included interviews and surveys with hundreds of students and experts, analysis of the difficulty and discrimination of the test items, and assessment of the reliability of the instruments. The instruments can be used in pre-post testing for biology courses and also to identify the misconceptions that are most persistent. Results for pretests can alter our approach to teaching by telling us what concepts our students find most challenging; this formative assessment can change the direction of a course to better suit students’ needs.

#27

Partnership between Research and Upper Division Instruction
Leslie Zeman, Biology

Undergraduate research, while very desirable, cannot accommodate the large population of science majors who would benefit from a short term exposure to research. How can we design an alliance between a research lab and a senior-level lecture and lab science course that will support a large number of students in a meaningful, highly structured research project which lasts only one quarter? In this model, Biology 403 students study cellular anatomy, physiology and
pathology in lecture and in conventional histology laboratory instruction. In partnership with the Center for Emerging and Re-emerging Infectious Diseases, students receive preserved murine tissues from an ongoing Malaria study. Students completely process, section, stain and evaluate histologic sections from target organs of control and study mice. Working collaboratively in the instructional lab, student teams capture photomicrographs and write a pathology report. To quantitatively assess the added value of this collaboration, we will compare the arc of exam performance in this quarter to the same metrics for students in a previous quarter, who developed a project not affiliated with ongoing research. If this instructional method adds value to student preparation, we predict that a higher percentage of UW Biology majors, who have completed a course with this structure, would secure scientific employment or admission into professional or graduate school than students who complete only academic courses.

#28

End of Lecture: A Meta-analysis of STEM Courses
Scott Freeman, Biology

To test the hypothesis that lecturing maximizes learning and course performance, we meta-analyzed 225 studies that reported data on either exam scores or failure rates when comparing student performance in undergraduate STEM courses under traditional lecturing versus active learning. The effect sizes indicate that on average, student performance on exams and concept inventories increased by 0.49 standard deviations under active learning (n = 158 studies), and that the odds ratio for failing was 1.95 under traditional lecturing (n = 67 studies). Heterogeneity analyses indicated that both results hold across the STEM disciplines, that active learning increases scores on concept inventories more than on course exams, and that active learning appears effective across all class sizes—although the greatest effects are in small (n ≤ 50) classes. Trim and fill analyses and fail-safe n calculations suggest that the results are not due to publication bias. The results also appear robust to variation in the methodological rigor of the included studies, based on the quality of controls over student quality and instructor identity. This is the largest and most comprehensive meta-analysis of undergraduate STEM education published to date, with results that raise questions about the continued use of traditional lecturing as a control in research studies, and that support active learning as a teaching practice in regular classrooms.

#29

Undergraduate Research on Photosynthesis and Respiration in Closed Ecological Systems
Frieda Taub, School of Aquatic & Fishery Sciences; Anna McLaskey, School of Oceanography; Christina Tran, School of Aquatic & Fishery Sciences

How can we actively involve elementary biology students in such apparently abstract subjects as global O2 and CO2 cycles, pollution impacts, and Vision and Change’s Core concepts of (4) Pathways and Transformations of Energy and Matter and (5) Systems—ecosystems? We propose a multi-week laboratory exercise as part of an introductory course, in which the students design half of the experiment. These small (250 ml each) Closed Ecological Systems involving algae, and in half of the treatments grazers (Daphnia), usually involving 4 treatments, each with 6 replicates, has been successfully used by undergraduate students in independent research projects for several years. We propose to adapt this activity to a class activity with multiple teams, each team doing the same controls (algae only, algae plus grazers), and with different teams testing different impacts, such as nutrient enrichment, insecticides, herbicides, local runoff, warming, or other
effects of their choice. The use of replicates demonstrates biological variability and the data can be used with informal or formal statistical analyses. With a pH indicator, students can be introduced to light-dark changes in CO2. The biological results are obvious without instrumentation by the intensity of greenness and animal counts. We propose that students who design half the experiment will increase their awareness of earth’s carbon and oxygen cycles, photosynthesis and respiration, ecological feeding relationships, and local pollution problems. Student awareness can be tested by comparing examination responses and questionnaires of student involved in this activity, as compared to the current lecture and laboratory. Because the systems are closed, the students can consider these bottles as an analog to the earth’s atmospheric regulation by photosynthesis and respiration of green plants, animals, and microbes. The implications will be more informed citizens recognizing the potential of humans to impact important ecological relationships.

#30

**MPH Students in a Problem-Based Learning Program Assist ACA Implementation**

Kelly Gilmore, Leigh Alderman, and Amy Hagopian, Health Services

Background. The University of Washington’s “Community Oriented Public Health Practice” (COPHP) MPH degree program worked directly over the last year to engage students in several projects to help implement the Affordable Care Act. COPHP students learn the entire two-year MPH curriculum through cases and problem-based learning opportunities. Cases written by faculty often include assignments for real clients.

Methods. Students worked on three ACA cases this year: 1) The Washington State Health Benefit Exchange (the public-private partnership administering the state’s insurance exchange) asked students to design an evaluation; 2) Public Health-Seattle/King County asked students to design strategies to reach small businesses to encourage them to offer coverage; and 3) A service agency asked students to design enrollment messaging for homeless youth. Students met with faculty twice weekly in three-hour blocks. “Clients” made themselves available for meetings with students and came to final presentations. Clients will be asked at the end of the year to fill out an online survey regarding the student products examining if the product has been or plans to be used by the agency, their experience working with students as consultants, and if they garnered any new understanding of the ACA from the student work.

Results. Students designed an evaluation of the Exchange’s “Apple Health Plus” scheme to ensure continuity of coverage for lower-income families. For the health department, students discovered a variety of resources and presented a clever strategy to entice businesses to expand insurance offering. For the youth agency, students customized ACA navigator resources for the specific homeless population. Client survey results will inform future student projects.

Conclusion. The Affordable Care Act offers opportunities for students to engage in practice-based learning when faculty and program implementers work together.
Successful Collaborative Training at Scale
Jenny Halpin, Odegaard Writing & Research Center; Matt Davidson, College of Education; Josh Pahang, Bioengineering; Jacob Kovacs, Economics; Yunfei Zhao, Communications; Allie Draper, English & Spanish; Rachel Brown, Near Eastern Languages & Civilization

Our program has doubled in size year-over-year, necessitating tutor training both on a much larger scale and in partnership with nine other writing centers. The changes in scale have made developing preliminary training materials – that is, materials that would be functional, responsive to different stakeholders, faithful to shared goals, and methodologically and philosophically sound – challenging. Complicating variables this Autumn included: 100+ participants (graduate and undergraduate, with widely varied degrees of experience, from many fields, many multilingual); ten hours of instructional time over two days; mixed instructional methods; and many different facilitators. Having attempted this feat, we sought to investigate to what extent this sort of intensive preliminary training in ideologically-nuanced principles for practice successfully equipped participants for the complexities of teaching encounters. And what additional professional development would be best suited for filling participant-identified gaps?

Our initial assessment mechanism was a survey of all participants six weeks after training, asking what workshops had been most and least helpful for their ensuing practice. Additional measures included observations and comprehensive interviews aimed at helping participants identify areas for additional professional development. Together, these assessment methods revealed that our fundamental learning goals for the preliminary training were achieved. However, uptake of some more complex ideas informing practice was notably uneven. This cued the need for additional professional development opportunities, which we offered in the form of all-staff conversations, one-to-one mentoring, and supplemental workshops. Among our findings is a qualitative account of additional (effective) training efforts over and above the initial two day session.

We posit that our process of workshop development, experiences with preliminary and supplemental training, and participant-driven findings will be valuable for departments and programs trying to train large, diverse groups in complex teaching and learning principles.

Addressing Diverse Content Background with Hybrid Course Design
Kimberlee Gillis-Bridges, English

My SOTL poster will focus on the redesign of my English 213 course, a 200-level survey of modern/postmodern literature that I transformed from a twice-weekly lecture/discussion into a hybrid format. Data from three years of student intake surveys highlight the demographic range the course attracts. Sixty-three to sixty-five percent are first- and second-year students who recently have analyzed literature in high school. A significant minority (35%-37%) are third- and fourth-year students who either haven't analyzed literature in some time or have declared a major that gives them extensive experience analyzing literary texts. Given students’ markedly divergent experience analyzing literature, I designed my course to investigate several questions: How does a blend of face-to-face and online learning help students effectively master course outcomes? How does interaction with more- and less-knowledgeable peers affect student learning?

The course redesign, which I undertook as part of the Technology Teaching Fellows Program, featured sequenced series of synchronous and asynchronous individual and group tasks. Throughout the term, I strategically assigned students to groups based on their current and
emerging facility with course skills and materials.

To assess the impact of new methods, I surveyed students at the middle and end of the quarter and compared work produced in blended and face-to-face versions of the course. While I am still processing end-of-quarter data, the mid-quarter assessment indicated that students wanted additional opportunities to read and respond to multiple groups’ ideas online. Moreover, my comparison of student work from face-to-face and hybrid versions of the course indicates that the blended learning group more effectively translated peer feedback on ideas-in-progress into formal essays.

Although my sample size is small, my study has implications for faculty peers who have encountered challenges similar to mine when teaching introductory courses or who would like local models to draw upon should they move their courses online. With the initiation of online degree completion in the College of Arts & Sciences, I hope my project will encourage colleagues to consider how their courses might benefit from an environment where time isn’t rigidly structured, an environment where our students can fully engage in the slow and recursive analysis humanities disciplines emphasize.

#33
Using Canvas to Facilitate In-class Discussion in Large Classes
Louisa Mackenzie, French & Italian Studies

I have developed a larger class on French Cinema to be offered in hybrid format as of 2015. The particular question I ask here is: how can I use online tools to better engage students in the classroom? To do this, I have designed a series of low-stakes assignments on Canvas that students complete before coming to class. The particular activity I focus on asks students to select a film clip (uploaded to Canvas), and to write a technical analysis. This activity prepares students for discussion in class.

The course is a 200-level lecture. It has no prerequisites and has attracted freshmen to seniors, engineers to sociologists. However, it also counts towards our French major. I thus have to engage a wide spectrum of familiarity with critical analysis of cultural products. The course aims to develop the skills of close reading and analysis while still focusing on general thematic topics more likely to engage students in discussion.

This year, my assessment of this practice focused exclusively on assessment of student achievement. Next year, I plan to assess the effectiveness of the activity in transforming in-class discussion by asking “before and after” questions, inviting students to discuss films immediately after viewing and again after completing the assignment. I hope that this assessment provides robust evidence of the way the assignment helps students move from subjective to analytical discussions.

As someone who tends towards techno-scepticism, I am learning that strategic use of LMS can enhance the in-class experience. Certain activities that are difficult to facilitate without Canvas can engage students in new ways. I welcome the opportunity to share the advantages of these film clip activities with colleagues.
As a 2013 Technology Teaching Fellow applicant, I was interested in how a learning management system like Canvas could facilitate foreign language teaching and learning inside and outside classroom. I also investigated the possibility of using Canvas to better manage workload for teaching assistants and at the same time not to compromise student learning opportunities.

After being accepted and training as a Technology Teaching Fellow Summer 2013 and having integrated Canvas into my courses for Autumn 2013 and Winter 2014, I would like to take the opportunity the Symposium presents to share my experience in using Canvas to promote active and collaborative learning for foreign language education. Student feedback would be solicited and gathered by having students fill out a user satisfaction survey about their learning experience within the Canvas environment. At the Symposium, I plan to demonstrate key features within Canvas that facilitate student learning in either a traditional or a hybrid course using its multimedia features and discussion forum. I would also utilize the feedback from students and teaching assistants to discuss with Symposium participants the advantages of course management within Canvas in terms of information dissemination, grade recording and learning outcome assessment, as well as answer questions about the pedagogical and administrative challenges of committing to such a system.

Being not-so-tech savvy, my experience of learning and using Canvas and of being supported by the Center for Teaching and Learning and UW-IT may help Symposium participants identify their pedagogical needs and wants and direct them to the already available resources on campus if they decide to make Canvas an integral part of their course planning or course transformation in the future.

Two research questions guided a multi-university (including UW) study of intergroup dialogue (IGD): (1) What are the outcomes of IGD?, (2) What processes influence the outcomes? IGDs engage diverse students in learning about identities, inequalities, and social change. IGD courses use a four-stage model: setting the ground for engagement, exploring identities and inequalities, engaging controversial issues, and alliance building/action planning. Facilitators use content and structured interactions to engage students.

To assess effectiveness, students were randomly assigned to dialogues or matched waitlist control groups (N=1432). Students completed a pre-test survey (beginning of quarter/semester), post-test survey (end of quarter/semester), and delayed post-test survey (a year later). Surveys measured outcomes (intergroup understanding, relationships, and collaboration) and psychological processes (cognitive openness and affective positivity). The post-test survey measured learning engagement and communication processes (engaging self, appreciating difference, critical reflection and alliance building). To assess additional processes, we interviewed IGD students about their learning, and video-taped three dialogue sessions to observe student and facilitator behaviors.

The results showed: IGD students, more than control group students, increased in intergroup
understanding, relationships, and collaboration; and IGD pedagogy facilitated communication processes that affect psychological processes, and together they affect outcomes at post-test. Only the communication processes explain effects of IGD a year later. Interviews revealed a distinction between relational empathy (appreciation of individual experiences) and critical empathy (appreciation of sociostructural impact on individuals/groups). Correlational analysis of video data showed positive facilitator behaviors related to dialogic student engagement, and facilitator advocacy behaviors related to anti-dialogic student engagement.

Implications include: explicit attention to classroom diversity can yield positive learning outcomes; structured interactions and facilitative guidance beyond content are crucial in actively engaging students; constructively leveraging communication interactions and individual psychological processes are important for maximal learning; and, training faculty for diversity teaching can emphasize intentionality of dialogic communication and techniques.

#36
*Teaching Natural History Integrated with Art and Other Cultural Connections*
Ursula Valdez, Interdisciplinary Arts & Sciences, UW Bothell

Natural Science is a fascinating discipline that helps us understand how life functions. However, learning sciences can be challenging and overwhelming for students and for instructors. Currently, more instructors are incorporating different approaches to teach science and get students more excited and efficient at learning it.

I have developed a new course in which I am using the natural history of American Crows to introduce pre-major students to the integration of science with other disciplines, and I aiming for a higher level of student engagement. In my course, students are exploring and discussing the scientific research on Crows natural history, and their past and current connections with history, poetry, human culture, art, media, etc. Students are researching the scientific literature on crow topics and also developing an art project that expresses their personal learning based on sound science. Art projects range from sculpture, paintings, ceramics, and stained glass to songs, children’s books and others. Students are also documenting their learning in an old-style handwritten journal, and as a class we are keeping a public blog that reflects on the class topics. I am conducting surveys among the students to assess what they knew before and after taking my class, as well as having them rank their interest in learning science before and after taking the class. From the class surveys and the assessment of the quality of their work, journal and blog entries and my direct interactions with students, I have found a higher level of student engagement compared to other natural sciences classes I taught before.

Exploring alternative ways to teach sciences rather than just the conventional ones, is an option that instructors should consider if their goal is to increase engagement and as a consequence long term learning.

#37
*A Tale of Two Technologies: A Tablet and Clickers*
Erin Hill, Science, Technology, Engineering & Mathematics – UW Bothell; Ian Porter, Information Technologies

The role of mobile computing devices and classroom response devices (clickers) in teaching and learning constitutes an important thread in the discourse in contemporary higher education. Our
work contributes to this discourse by asking the following research question: does the use of a tablet computer by the teacher and the use of clickers by students enhance teacher-student interaction and student learning and engagement in class activities?

In Winter 2014, an iPad and clickers were used in a UW Bothell introductory physics course with 46 students who are planning to pursue degrees in STEM. Students used clickers to respond to multiple-choice, in-class questions to gauge their initial individual understanding of concepts. Students then worked in groups of four to discuss their reasoning, and were polled again. On average 40% of students initially selected the correct response; a number that increased to 80% after small group discussions. Class discussions were held to expose the reasoning behind responses and to correct any misconceptions.

Through the Doceri app, the iPad allows the instructor to: control the epodium computer and projector, draw on a virtual whiteboard or on images, and take pictures of student work to project to the class. This provides the instructor the freedom to move around the classroom to interact with the students in small groups, and to highlight student work and reasoning.

We will present the overall results of clicker questions, a few sample pictures of student whiteboard work, overall results from a pre and post assessment that shows gains in conceptual knowledge, and sample clicker questions for participants to see the technology in action. We will also share observations of the impact of this technology on the class and the instructor. Ultimately, our work demonstrates how thoughtful use of technology leads to student engagement and enhanced learning opportunities.

#38

*Teacher Professional Development: Covering the Distance*

Helen Buckland, Nursing; Conn McQuinn, Technology & Learning, Puget Sound ESD; Stephanie Van Alstyne, Puget Sound ESD

Our poster displays evaluation of development of professional learning communities (PLCs) for high school biology teachers to support implementation of BIOL 100, developed through National Institute on Drug Abuse (NIDA) funding. We ask: How do teachers use a social networking site and Professional Learning Communities (PLCs) to provide and receive support for science lab/activity development and implementation with their students?

Our students are high school biology teachers from Washington State (N= 31). They teach Biology 100, Science of Addiction through UW in the High School, a dual enrollment program. Training in core concepts in the neurobiology of addiction occurred: 1. at four day institutes at the UW (Summer), 2. during Saturday workshops (Fall/Winter), and 3. through an Edmodo social networking site, where they provided each other support in the teaching /learning process from 08/2011-03/2014.

Methods used to assess impact of PLC opportunities included: 1. review of interactions and postings from January 2013-March 2014 on Edmodo, 2. PLC evaluation at the final in-person PLC, 03/101/2014, and 3. telephone/in-person interviews after the final in-person PLC, 03/01/2014.

Results and lessons learned will be available after 03/31/2014.

Implications will include recommendations for: 1. PLC components for teachers of in-person and on-line courses with high school students, and 2. methods to support teachers state wide,
nationally and in rural and underserved areas where in-person PLCs are not as readily available due to minimal numbers of teachers in the same discipline and/or great distances between teachers.

This project was funded by the National Institute on Drug Abuse, National Institutes of Health under Award Number R25DA028796. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

#39
Summer Institute Intensives: Lessons Learned to Support Middle School Teachers
jenny williamson, School of Nursing, UW EO, & LIFE Center; Bruce Cunningham, Puget Sound ESD

The University of Washington’s School of Nursing, School of Education – LIFE Center (Learning in Formal & Informal Environments) and the University’s Educational Outreach collaborate with the Puget Sound Educational Service District (PSESD) to engage middle school science teachers, students and parents/community groups in neuroscience education asking: “How do I learn?” and “How do I teach students about how they learn?”

Our “students” are middle school teachers from Washington State (Year 1 N= 27; Year 2 N=28). Our poster displays evaluation from two intensive summer institutes (SIs), 1 week each in length, held July 2012 and July 2013. The goals for teachers are to increase their knowledge of 1. neuroscience research related to learning, 2. the Challenge Cycle (a cognitive learning model), and 3. related teaching resources.

We ask: 1. How do summer institutes support learning related to project goals?

Methods used to assess impact of the SIs included: 1. pre/post institute surveys (10 open-ended questions related to content about neuroscience and learning; what they know/want to know), 2. reflections on daily activities, 3. a comparison of initial and revised thinking about each topic and 4. keystone plans (description of activities to implement with students).

Results include a comparison of themes related to: 1. neuroscience of learning, 2. each activity in the institute including logistical considerations of the activities, and 3. the ability to plan a Keystone project based on the SI experience. Implications will include recommendations for SI planning for year three of this program.

“How Do I Learn” (R25DA033002) is funded by the National Institutes of Health (NIH) Blueprint for Neuroscience Research and administered by the National Institute on Drug Abuse, part of NIH. The content is solely the responsibility of the authors and does not necessarily represent the official views of NIH.