

# *Reflections from the Classroom*

2012-13

Volume 15

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# Overview

This volume of *Reflections* chronicles recent developments at KU of engaged and active learning in a wide range of classes. The body of work described by these skilled educators represents a pleasing level of maturity in the thinking of KU faculty members, having moved far beyond the forms of teaching they experienced as students. These colleagues are creating the next generation of educational experiences for students in their home fields, designing courses that incorporate modern tools and techniques both for learning and for representing students' intellectual discovery and understanding.

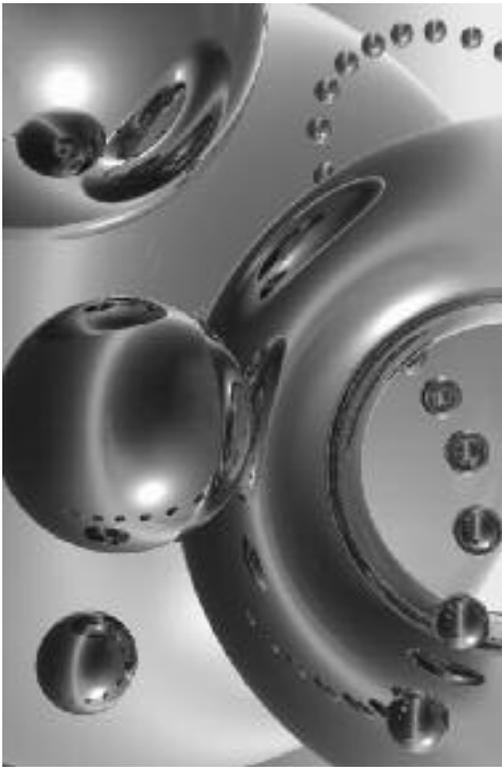
The work spans a range of students from first semester through masters degree studies, but in each case the goal is to produce nuanced and rich understanding by engaging students as active participants in the development of their knowledge and skills. Rob Bayliss describes the broad programmatic goals of first year seminars, intended to prime the intellectual pumps of entering students. By bringing students out of a passive mode of accepting predigested conclusions, the first year seminars set a different expectation for both the process and the product of university education. Stephen Johnson describes how assignment design enhanced a second year course in poetry, giving students small but manageable challenges in critical analysis. The synthesis and integration of those frequent bits of writing helped students become confident writers at a larger scale of analysis.

Jeff Hall describes how he got useful ideas by reading the work of KU colleagues, as he worked to help students be better prepared for class time in a statistical methods course. Using video technology he was able to provide brief out-of-class tutorials that could make face-to-face class time more productive. His reflection talks about the challenge of finding a way to have most students adopt the active stance of using the work as preparation for class. Susan Marshall offers a well-constructed comparison of three forms of teaching the same cognitive psychology content. Her analysis of student learning in lecture, hybrid, and fully online versions of the same course reveals the benefits of both technology-aided preparation and face-to-face engagement in advanced thinking and problem solving.

Dan Hirmas reports on a wide ranging redesign of a course in soil science for geography majors. By having students write briefly about each reading, he helped them be better prepared to take on challenging and counter-intuitive problems. He also used a series of small assignments to help students build up to a large final project, and as a result of successful learning he was able to bring all students to C level performance and above in this important foundational course. Chad Kraus also combined several ideas in revising a required masters-level course in architectural theory. He used online quizzes to help students know how well they understood readings, and he introduced group-based learning into the face-to-face time. He also added guided student review of each others' drafts of an essay, and students produced high quality digital video projects instead of typical final papers.

All of these innovative faculty members came up with individual, coherent, and meaningful ways to help students become active and engaged learners. Some used a number of technological and online tools, while others offered virtually digital-free classes. The tools were not the focus of their planning, nor were they the departure point in their thinking. These faculty members thought deeply about how to engage their students in the knowledge, skills, and understanding of their fields, and then they used instructional designs that supported their teaching goals. When online resources were helpful they were used, but only as needed. This issue presents a terrific view of the leading edge of mature thinking about learning and teaching at KU. It bodes well for the continued growth of intellectual inquiry into teaching by faculty and further enhancement of deep learning by students. These essays suggest that it is a very good time to be a university faculty member.

Dan Bernstein  
CTE Director



# First Year Seminars: Laying the Foundation for a Career of Learning

**Robert Bayliss**  
Spanish & Portuguese

It is generally agreed that as educators we do well to promote a culture of learning that asks students to take responsibility for or to assume ownership of their own learning. We generally understand that today's college student has come of age in a cultural climate with significant epistemological differences from our own pre-millennial upbringing, and that so far we have only scratched the surface of the potential of 21st-century technology to enhance student learning. But as educators at a public university in a state that regularly faces lawsuits over its constitutional duty to educate its K-12 citizenry, we also experience a classroom environment in which our student population is often ill prepared to assume such ownership of its education; many of our students arrive at KU without the skills necessary

to learn actively. It is this critical disjuncture between student learning skills based on K-12 preparation and student learning needs in the 21st century where the KU's Office of First Year Experience and its program of First Year Seminars seek to intervene.

"Disjuncture" seems to be an appropriate descriptor here, because students entering our university are active participants in digital culture, but they often have not had to apply these participatory skills to their formal education. Social media and the instant gratification of curiosity made possible by mobile devices mean that students today consume information less passively: the lexicon of the digital age—gaming, liking (as on Facebook), tweeting, blogging, etc.—demonstrates that even watching television in physical isolation

often incorporates highly engaged modes of social interaction. Another term, “googling,” suggests how this digital epistemology now allows students to efficiently find immediate answers to objective questions. The challenge we face stems from the fact that this mode of engagement is not regularly associated with the university classroom, where students see their role as essentially passive, simply absorbing information presented to them. Whether we attribute this passivity to traditional, lecture-based pedagogies, to a poorly funded K-12 system with a curriculum increasingly driven by standardized test scores, or to something else, the fact remains that our job is to produce graduates who critically engage with how we formulate and solve problems, despite the fact that they often enter the university hoping to be told what it is that they’re supposed to learn and how it is that they’re supposed to learn it.

The broader mission of the Office of First Year Experience is to help students make a successful transition to KU, from Orientation through the first year of enrollment; for the majority of traditional students this implies a successful transition from high school or junior

college to university life. In light of the above discussion, we may say in more specific terms that this mission involves the integration of first-year students into an academic climate of active learning, despite academic expectations that often involve being passively educated by the university. In particular, the First Year Seminar program constitutes a down payment on the broader institutional mission of producing active-learning and critical-thinking graduates, by placing

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new students in more direct contact with faculty and in more intimate classroom settings than are generally provided by the large, lecture-based introductory courses traditionally populated by freshmen.

As we reflect upon what we can learn from the pilot seminars offered in Fall 2012,<sup>1</sup> and as we develop an expanded menu of course offerings for Fall 2013 and beyond, our hope is to provide an ever-increasing portion of incoming freshmen classes

with an academic experience that leaves them primed for a career of active learning.

The fact that these seminars are topics-driven according to the strengths and intellectual interests of the faculty who teach them—a model chosen by the First Year Seminar steering committee after researching similar programs at other institutions—allows faculty to develop and structure courses that best provide opportunities for first-year students to experience critical inquiry firsthand,

to see how active learning is done from close proximity according to the specific disciplinary parameters of the professor. While this cognitive apprenticeship approach supported a diverse array of course offerings among the 11 pilot courses offered, it was also deemed important for the First Year Seminar program to adhere to a set of common principles and learning objectives that would in turn establish a common identity and curricular

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<sup>1</sup>Fall 2012 FYS topics were Beyond English: Is One Language Enough in Today's World?; Commerce Today: Is This What Adam Smith Envisioned?; Drugs, Cars, Cops, and Social Justice; Innovations in Bioengineering; From the Locomotive to the Smart Phone: Culture, Space, and Time in the Machine Age; Living in a Visual World; Once Upon a Time... Narrative, Culture, and Adaptation; Our Future Energy: Myths, Solutions, and Sustainability; Remembering Our Past: How Memory Works and Why it Matters; The Seduction of Culture and What to Do About It; Why Do the Birds and Bees Do It?

function for the program. All FYS courses will earn students credit toward the critical thinking component of the KU Core, for example, and all of them have privileged written communication to the extent possible within the parameters of the discipline and course topic.

The implied goal of these common FYS principles is, in effect, active learning itself. Critical thinking implies that student learning extends beyond the passive receipt of information to the synthesis, evaluation, and assessment of the sources of that information and the perspectives from which it is offered; written communication implies developing the ability to articulate one's critical thought in writing. These are but two pieces of the larger set of tools through which FYS courses seek to engage first-year students in the active pursuit of learning. A third aspect, a capstone assignment, structures student work in a way that lays out a concrete end-of-semester product about which students are made aware from the beginning of the course; students are thus encouraged to consider how the learning and understanding acquired during each class session may contribute to this larger project and its implicit learning objectives. Other commonly used course enhancements across most FYS courses included research workshops provided by KU Libraries (facilitated by the FYS library liaison Jill Becker), guest speakers from other fields or disciplines, incor-

poration of some (if not all) of the KU Common Book, and out-of-classroom experiences related to course content (including Lied Center performances, class meetings at campus museums and other facilities, and visits to off-campus or "real world" sites connected to course content). For Fall 2013 we hope to add to the FYS program a more holistic and inquiry-based approach to questions of academic integrity.

What all of these elements share is the idea that by structuring student coursework so as to make it more explicitly connected to the broader educational mission of the university, students will see the immediate value of taking responsibility for their own learning. As we continue to develop and refine the program, we will assess the extent to which these and other strategies contributed to the broader program goal of priming first-year students for an academic career that requires their active engagement.

To the extent that KU demands of its students such active ownership of their own learning, the FYS program and other Office of First Year Experience initiatives hope to lay a strong foundational experience for new students that will continue to resonate throughout their academic careers. Now more than ever, our students arrive with the raw ability to investigate, participate, and collaborate in our contemporary digital culture; our mission should be to convert these social skills into academic skills to drive critical inquiry, reflection,

and the active pursuit of knowledge. In a cultural climate where cost-benefit analyses and the so-called "banking" mentality of education (a student and his family invest a given amount of money and time with the understanding that it will yield a commensurate product of market-ready career employment skills) drive discussions about the value of higher education, such academic skills are more necessary than ever. ♦

# Using Creative Writing to Engage Students in a General Education Course

Stephen Johnson  
English

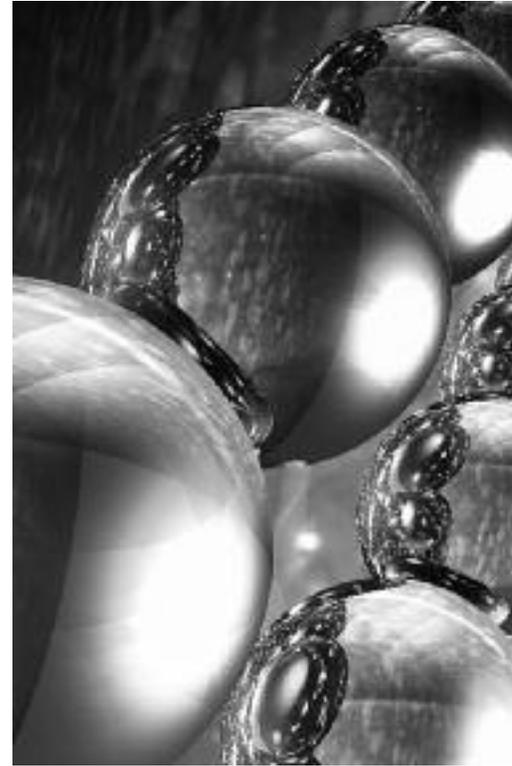
All too easily instructors can blame students for lackluster performance — I have done so myself— and in part it is so easy because we do have those few students who can write essays we yearn for, essays with a pulse. Those student essayists always have and always will grace our classrooms. Either they are exceptionally bright and capable or they are enthusiastic English majors, often-times both. While one, sometimes two, students out of 25 — I do not recall ever having three — are indeed English majors, the rest come from, well, everywhere else.

I redesigned my English 210: Introduction to Poetry course for everyone else from everywhere else. This course is an option for fulfilling the third and final requirement in the first- and second-year English program. Nearly all students earning their undergraduate degrees at KU must complete this sequence of classes, so the vast majority are non-English majors. I restructured my section of Introduction to Poetry to include a significant creative writing component that would complement the existing research component.

The first- and second-year English classes are not lecture courses; they focus rather on a process-oriented approach to writing generated from discussion, skills-building exercises,

and workshops. In my Introduction to Poetry course, however, I had lightened up on these process-oriented requirements because first, I thought students might feel condescended to — they had already been through all this, right? — and second, I wanted to use class time to cover more literature, and in my classes that meant going heavy on discussion.

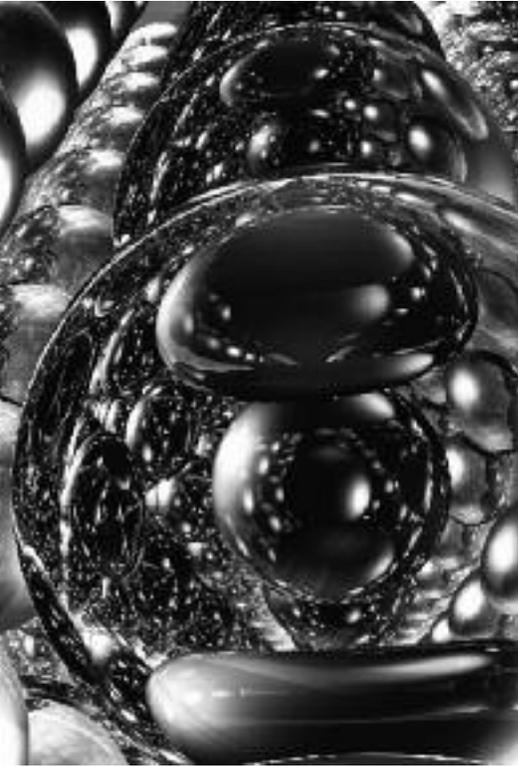
That approach, with little attention paid to the writing process, was not working as indicated by the essays that came out, especially early in the semester, as typical analysis papers that formulated a thesis and then generated an answer. But the majority of the papers were simply that, answers that solved a poem's mystery, and in just 500 words —exactly what



most students believe all teachers of literature want. So I had to read essays that were often without individual investment or a creative and vital exchange between the reader and the poem. In a sense, the essays were lifeless.

## New approaches

In the new rendition of the course, the semester is broken into four sections, the first of which is devoted to making students more comfortable with poetry while preparing them to incorporate creativity into their critical thinking. The first section of the semester is meant to get the students and the poem out of the classroom and onto the playground of curiosity and play. Yes, play — in academia. The great secret that many



students could benefit from learning is that academics do what they do in a spirit of play and joy and curiosity, at least initially.

Early homework assignments are designed to supplement our class discussions of poems. For example, in one assignment students are asked to record uses of figurative language they hear outside the English classroom and to pay particular attention to professors in other areas of study. They are often surprised by how many examples they collect of non-English professors being “poetic.” Another assignment calls for students to rewrite one of our poems for discussion, their goal being to eliminate all uses of figurative language. The most literal and

therefore worst poem submitted wins. By playing around with the poem and being creative, or, as with this rewrite of a published poem, un-creative, students explore the process behind composition instead of just the product.

#### Process versus product

I have observed that one of the major skills we try to teach in the first two required courses (English 101 and 102), using writing as a cumulative process in problem-solving, falls off dramatically in the third course. I often found that papers not only showed signs of being written the night before, but, even worse, they were written to meet what they thought were the typical expectations for just one more literary analysis for one more literature class—simply to jump through that hoop.

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To solve this problem I designed many small homework assignments, mostly micro-themed responses, due long before the formal essays were due. By the time students were working on papers that would have a significant impact on their grades, they had already generated a considerable body of work. Moreover, these responses were far more likely to reflect genuine readings of the poems rather than regurgitated material from

online sources for this very important reason: in these low-stakes assignments students are encouraged to ask questions, share what they do not know, or are utterly confused by, with me and the class. In fact, during class discussion I am sure to praise these kinds of explorations in ignorance. Even better, I have found that in small group discussions students willingly tackle difficult questions together.

#### Decoding the discipline — reorienting students

Poetry has no relevance to students’ academic interests. Poets might as well be aliens sitting under alien trees and dreaming alien dreams, and that is not the worst. These aliens spend all their time thinking about clever ways to use rhyme and alliteration. In fact, it is all they care

about. My goal early on in that first part of the semester is to take the alien-ness out of what poets do and why they do it.

As mentioned previously, early reading, writing, and thinking about poetry are meant to be playful. The series of micro-themed papers I use ask students to consider how poets play with language. What are they doing to be creative and have fun with language? What poems do you simply like because of their sound, their

look? These kinds of natural questions (I say *natural* because students answer these kinds of questions every day, about songs, movies, commercials, signs) are followed by more weighty thematic questions.

The thematic questions, however, do not have to be accompanied by a student's answer; rather, they may pose questions, even ones they think unanswerable — all the better, I tell them — to submit to class discussion. I ask them to be creative with their questions and not to worry because they are not required to have an answer. These are low-stakes homework assignments for which they may earn full credit with reasonable effort.

In addition to reorienting the students by introducing them to the play in language, early assignments ask them to identify themes and questions in poems that they come across in other areas of study. The most obvious candidates come from history, women's studies, religious studies, political science, philosophy, and art, but the possibilities are limitless and depend entirely on what disciplines motivate the students.

I cannot say the class took an interdisciplinary approach exactly, but my goal was to reorient the reading of poetry and study of literature somewhere among other academic pursuits so that various disciplines could inform each other, and hopefully some of the intellectual curiosity and excitement students experience in their own majors will transfer to their reading of poetry. I must say I

do take pleasure in the irony that part of getting students to move poetry out of an English classroom is asking them to find it in their non-poetry classes.

### Capstone project and results

The final section and primary creative component of the semester is devoted to close study and research of one or more major works; for example, T.S. Eliot's "The Waste Land," or an extensive selection of Emily Dickinson's poems. By this time students have generated their own questions and themes of interest through playful and serious exploration, including having written several poems of their own and having conducted research. The final project invites them to apply individualized thematic interests and an acquired working knowledge of the poets' tools to writing their own work.

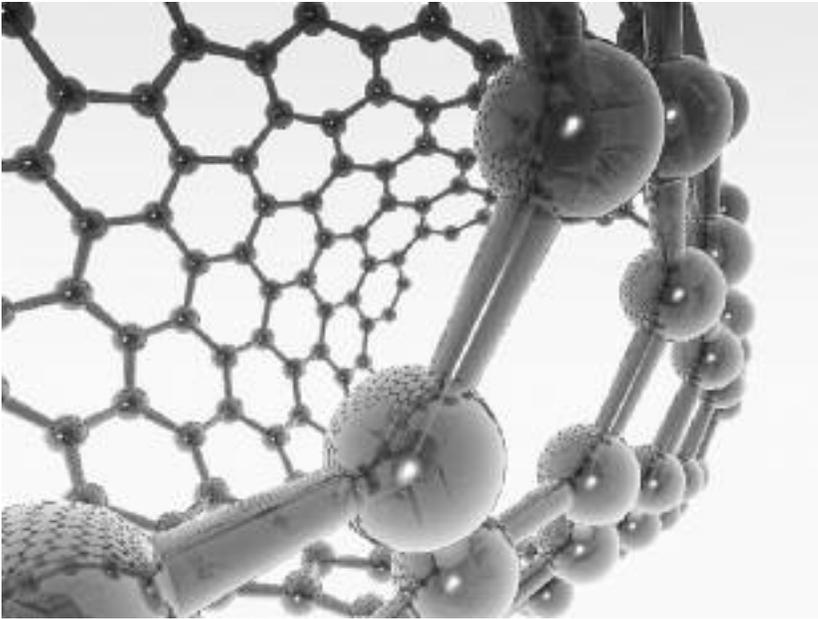
Of course students are not expected to create great works of literature, and I am perfectly clear in letting them know that projects are not graded according to what I think is good or bad or excellent poetry. Students are expected, however, to demonstrate an understanding of how poets work with sense and sound, theme and poetic devices, and they do so by writing the poem and a rationale that explains their intentions.

Furthermore, while students are required to work within the discipline of literary studies by applying research and analytical skills to their project, they are also encouraged to engage the

project from a point of view outside the discipline. These points of view included Greek Life on campus, or students pursuing interior design, environmental studies, history, or microbiology, all of whom approached their contemporary waste-land project from their respective discipline or interests. By the end of the semester students more readily moved back and forth between the playful and the academic, between the creative and the analytical.

While ostensibly I designed assignments to couple creative writing with research in order to teach sound writing skills, I was able to engage more kinds of students, from all the disciplines besides English, in ways that might convince them that literature is relevant to them, too, that writers actually are of the same species and share similar concerns. In our mission statement, the English department recognizes itself to be at the "core of the humanities," and I think these new assignments took that mission seriously and invited students from everywhere else to enter a conversation between their academic disciplines and the study of literature. ♦

*For a complete description of Johnson's teaching project, see [cte.ku.edu/gallery/portfolios/johnson](http://cte.ku.edu/gallery/portfolios/johnson)*



# Developing Online and Hybrid Models of Learning

Susan Marshall  
Psychology

Psychology 318 is an undergraduate cognitive psychology course that focuses on the scientific study of human cognitive processes. I have taught this course a number of times in a lecture format. In Spring 2012, I launched PSYC 318 as an online course for the first time. In Fall 2012, I retained the online version and developed a hybrid version of the same course, teaching two different sections simultaneously. This essay focuses on the two versions of Cognitive Psychology that I taught in Fall 2012.

There were about 30 students in the online course and 120 in the hybrid course (the latter met twice a week at the scheduled lecture time). PSYC 318 is a core psychology course required for majors and an elective for minors. It also appeals to a wide range of students outside of psychology because it deals with human cognition. I often

have a handful of students from architecture, engineering, journalism, and business enrolled in the course.

When I taught this course in the past in a lecture format, I typically had one large section, often with over 300 students. Due to the large class size and having only one teaching assistant, I did not incorporate a lot of writing assignments. I evaluated student learning using online Blackboard quizzes and multiple-choice exams administered during class time. I was troubled by the lack of writing in the course and wanted to redesign it to include more writing assignments. Students were also frustrated at not being able to express their knowledge and thoughts in multiple formats. I believe that writing is an important part of a college education, not just for developing communication and writing skills, but also for working on critical

thinking skills. With this in mind, I re-designed the course and developed new writing assignments for the initial online course (in Spring 2012), which I incorporated into both Fall 2012 courses (online as well as hybrid versions).

I was very pleased with the end product of the initial online course. It was well-organized but had the potential to become even better. As I tried some of my new materials (e.g., weekly written assignments), I saw students struggle with questions that I thought were clear and straight-forward. I also witnessed students demonstrating a depth of understanding that I was never aware of when teaching a large lecture section. It was eye-opening and rewarding. Probably the biggest success to come from that first semester of teaching online was that it forced me to think about my course and the material dif-

ferently. I tried to organize it in a way that would be more intuitive to the student so that the course content was easily navigated. This wasn't necessarily the way I thought about the material or how I had taught it for years, but rethinking that organization renewed my enthusiasm for some of the material.

The move to a hybrid version for my lecture class in the Fall of 2012 was a natural one. I had improved the course and had the foundation built for a hybrid version where students were responsible for some of the material outside the classroom, which freed up time during class meetings. I was excited to include more dynamic activities during class instead of simply lecturing. We could now do demonstrations so that students could see cognitive phenomena first-hand and understand why their minds work in certain ways. We could discuss these demonstrations, which meant my students were more actively involved in their learning as opposed to passively listening to me talk.

I redesigned both versions—online and hybrid—of the course with the following goals in mind:

- Understand basics of cognitive psychology
- Spark an interest in cognitive psychology
- Connect course materials to everyday lives
- Foster critical thinking and writing skills
- Be a critical consumer of information

### Online course

When I began to develop the online course, I re-visited my course goals, and using a process of backward design, considered the course content and methods of evaluation that I needed to facilitate and measure students' achievement of those goals. I realized that I did not need to be exhaustive and cover everything in cognitive psychology. Instead, I decided

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to focus on material that best aligned with my course goals. In doing so, I chose material that would offer the greatest diversity in representing cognitive psychology as a field and would spark student interest. Moreover, I needed to think about how to organize material in a way that would not be too overwhelming for students as they were no longer going to be led through it during class time. I worked with the Center for Distance and Online Learning (CODL) and developed online lectures that students could navigate at their own pace.

### Hybrid course

I used my online course as a starting point for developing the hybrid course. I already had all the material online, so I began by deciding what material I wanted to use in class that

would make for interesting discussion and group learning activities. I decided to use some of the online lectures to free up class time for those discussions and activities. For example, as part of a class on memory and mnemonic devices, we had our own memory competition during class. I had students read an article outside of class about the U.S. Memory Championships and then asked them to come to

class with a detailed mental map of some location in which they could mentally store a list of words. In class I gave them five minutes to study and memorize 40 unrelated words, presumably by mentally "placing" their words in the mental map. I proceeded with my lecture, and after 10-15 minutes I asked students to recall the 40 words that they studied. They were amazed at their very high levels of performance and saw first-hand how they could organize, store, and retrieve information effectively. A handful even had perfect performance! We then talked about the memory process and how elaboration and visualization can be used to improve recall. Since students had already come prepared for this exercise, they were engaged and actively participated in the class discussion on memory.

Along with the lectures, in both hybrid and online versions, I provided students with links to Internet resources (some of which came with the textbook), such as online study materials, demonstrations of cognitive phenomena, and popular press reports that focused on some of the course concepts.

### Methods of assessment

My course material is divided into 10 sections, and there is a written assignment, quiz, and lecture material for each section.

The grading system for both versions of the course is based on two areas: *Mastery* of concepts and *Effort* on the coursework. Students must do well in both categories to achieve a high grade. Mastery of concepts is measured using quiz and exam performance. Effort is based on pass/fail scoring of weekly written assignments.

As part of the Mastery grade for both courses, I created online quizzes that students had to complete for each chapter to evaluate their familiarity with concepts and to give students an opportunity to gauge their mastery of material prior to taking an exam. The quiz is available to them the entire time we are covering a section of material, and students can take it as many times as they like to achieve a perfect score. The 10 quizzes throughout the semester are equivalent to 25% of their Mastery grade, so students are encouraged to continue to interact with material during each section until they master it. There are also three regular

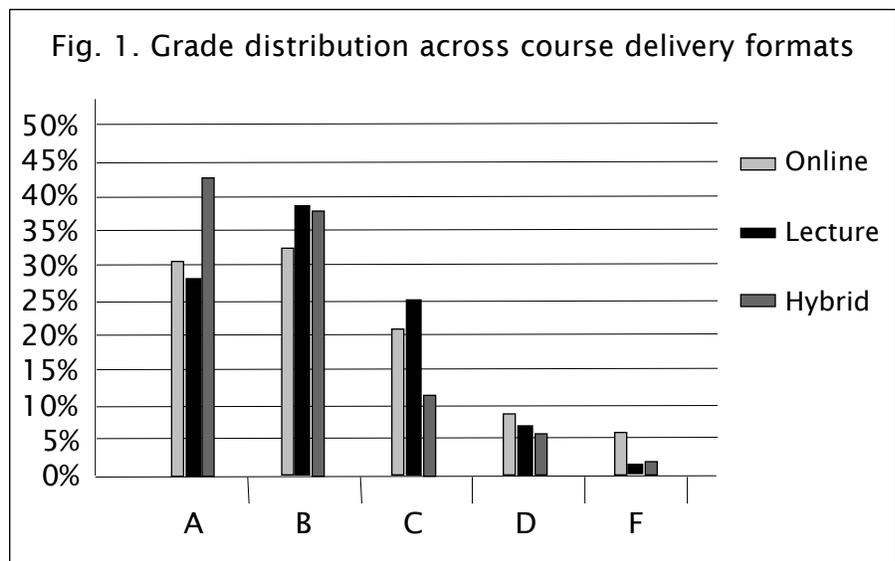
online exams, in addition to an optional comprehensive final exam that can replace a low regular exam score if students so choose. Exam performance makes up the other 75% of the Mastery grade.

The Effort portion of the course involves the satisfactory completion of weekly written assignments. The assignments are intended to foster critical thinking and deeper analysis of the concepts discussed in each section of material. I developed detailed instructions that guided students in what was expected for each assignment. Not only did these detailed instructions help students achieve my expectations, but they made the objective evaluation of each student's work much easier and something that could be completed by a TA in the larger hybrid section of the course. Assignments were graded on a pass/fail basis, so students received credit if they met the objectives outlined in the assignment each week.

### Student performance

After teaching the online and hybrid versions simultaneously, it is interesting to look at the differences in performance between the two sections. The hybrid class resulted in higher Mastery scores compared to the online section. The Mastery score reflects performance on the quizzes and exams. The median Mastery for the hybrid class was 84%, whereas it was 80% for the online class. Differences also emerged between the classes when looking at the Effort score, which is the number of written assignments completed out of 10 throughout the semester. Once again, the hybrid class had higher Effort scores compared to the online course. The median for the hybrid class was nine, whereas the median for the online class was eight.

I also examined the final grade distribution between the two types of classes (hybrid versus online), as well as compared those grade distributions to one



from the traditional lecture course I have taught in the past. The data are presented in Figure 1. I have taught the online version twice, so I added the two classes together to increase the number of observations ( $n=70$  for the online sections in Spring and Fall 2012). I used the data from two large lecture classes in Spring 2010 and Spring 2011 ( $n=528$  combined). And finally, I had a sample of 114 for the hybrid class (the Fall 2012 section). I first compared the percentage of students earning an A or B in the three class types. The online distribution showed 64% of students at this level, the traditional lecture had 67%, and the hybrid class was much higher at 81%. When looking at the other end of the distribution, the online classes had 14% of students who ended the semester with a D or F, the lecture version had 7%, and the hybrid class resulted in 7% of students at this level.

### Reflections

Clearly there are differences in performance among the various formats, with the hybrid version resulting in the best overall performance and not much difference, at least at the upper end of the spectrum, between online and traditional lecture formats. Differences do exist, however, at the bottom of the distribution between online and lecture classes, with more online students scoring poorly. The cause of these differences is unclear. The Fall 2012 online course was originally supposed to be a small lecture section taught by

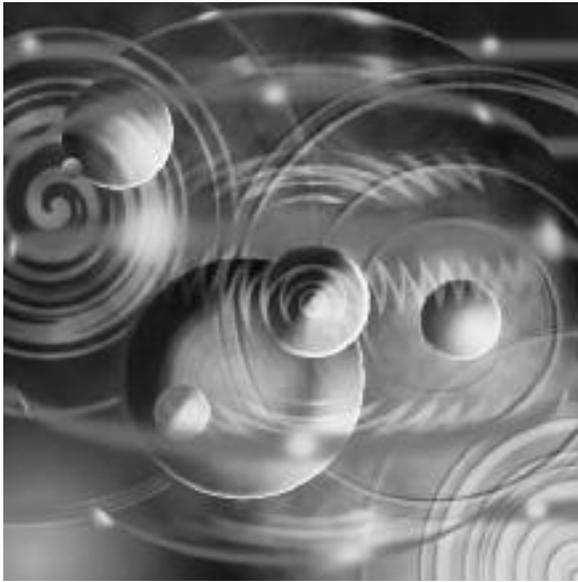
another instructor who had to take a medical leave of absence. I picked up the course at the last minute and the psychology department made it an online class to prevent a conflict in my schedule, to avoid cancelling it, and to continue to give students the option of taking it that semester. Therefore, the online students may not have really wanted or been prepared for the online experience, which requires a certain amount of self-motivation and planning. Their performance may have suffered as a result. Indeed, the performance of the Fall 2012 class (the impromptu online class) was lower (A&B=58%, D&F=19%) than the Spring 2012 class (the planned online class; A&B=68%, D&F=11%), which pulls down the combined distribution percentages reported above. I think the data from the two online sections must be interpreted with caution for this reason. As more students complete the online course, a better picture of typical performance from this format may emerge.

It is also possible that having regular contact with me and/or the TA resulted in better performance for the hybrid and lecture classes as compared to the online classes, because of reminders about due dates or interactions that helped to further understanding of the material. In comparing the hybrid and online versions, while the basic material and requirements were the same, the hybrid class got more opportunities to do interactive activities: more in-class exercises and demonstra-

tions, in-class discussions, in-class exam review sessions, and opportunities to network during class to form study groups for out of class interaction.

Overall, I was very pleased with the results from the hybrid class but somewhat disappointed with the performance of online students, at least from the Fall 2012 semester. The process of putting the class online in Spring 2012 is what made the hybrid version possible, and I think that the online format definitely serves a certain student population that is important to reach. However, the learning environment that students in the hybrid course experienced and the resulting depth of understanding that they displayed suggests that these two formats are unequal in terms of outcomes as well as student experience. ♦

*For a complete description of Marshall's teaching project, see [cte.ku.edu/gallery/portfolios/marshall](http://cte.ku.edu/gallery/portfolios/marshall)*



# Establishing Disciplinary Foundations with Discussion, Lecture and Writing

Daniel Hirmas  
Geography

In Summer 2011, I redesigned Geography 335/535, Soil Geography, to isolate and correct misconceptions among students in the course and prevent those misconceptions from being propagated to upper-division courses. Because there is so much material that is new to students in this course, lectures and assignments are compartmentalized by the various sub-disciplines as a way to systematize the subject. Although I try to emphasize connections among these sub-disciplines in the context of individual problems, one of the biggest challenges for students in this class is to integrate their knowledge across the individual learning units. This led me to my class redesign's guiding question: What are the best practices for discovering and correcting foundational misconceptions that lead to misunderstandings of more complex topics? In addition, how could I most

effectively engage students in the classroom to make lectures livelier and more productive? My two secondary goals were precisely to increase participation during lecture in an environment where students took ownership of the concepts, and to engender integration and problem-solving skills.

To address the primary goal of this project, I implemented two pre-lecture exercises: a 25-word précis, and decoding-the-discipline questions. The précis emphasized important concepts through focused reading of the required supplementary text, while the decoding questions directly targeted misconceptions that were observed in previous iterations of the course. Both types of pre-lecture exercises were also used to better prepare students for lecture, pique their interest by discussing their pre-lecture answers in class, and deepen in-class discussions.

## 25-word précis

When I taught this course in the Fall semesters of 2008, 2009, and 2010, students did not seem to be engaged with the material they were learning. In order to promote discussion and active thinking during lecture, I decided to implement an assignment that required them to fully engage the material before class during the Fall 2011 semester.

Once per week before lecture, students wrote out a statement containing exactly 25 words summarizing the required reading for that day. The 25-word requirement was designed to make students *carefully* choose their words in summarizing the main point. The ultimate goal was to promote more informed discussion and questions by introducing students to the topic before lecture.

I gave students very specific reading/writing instructions for each précis. Students were then required to compose (or copy and paste) their 25-word précis directly into the textbox in the active Blackboard assignment. Although I was unable to grade or provide direct feedback before lecture, since they were able to submit assignments up to the start of class, I spent five to 10 minutes in the hour before class looking over any submitted answers and getting a sense of how well students understood the concept from the reading. This allowed me to focus my lecture time on any misconceptions from the reading that seemed to be common among the students. I was explicit about this just-in-time teaching

strategy with the students, mentioning what errors or misconceptions I might have seen in a précis, although never directly calling out students by name.

## Decoding-the-discipline questions (or counter-intuitive questions)

In the past, I had occasionally surveyed students at the beginning of class to see what they thought the answer was to a particular problem. When most students answered the question incorrectly, I had noticed that

**The evolution of in-class discussions during the semester revealed that student understanding of the material had deepened and that many initial misconceptions had been successfully reversed.**

they seemed to take ownership of their own responses and wanted to understand why their initial answer was incorrect. This made them better engage during lecture because when students learned that they got a problem wrong, especially when they really trusted their intuition, they paid closer attention to the explanation, which generated interest in the topic and in the need to understand and approach questions from multiple angles.

To channel this reaction, I created a list of questions that challenge common misconceptions in various topics of an introductory soil geography course. These questions were answered on our course Blackboard site the day before lecture. To introduce the topic, I

presented students' collective responses in class. Afterward, we spent seven to 12 minutes discussing the answers and the reasoning behind them.

## Student understanding

The success of my implementations was formally evaluated by tracking scores on the 25-word précis assessed with an assignment rubric, as well as exam questions that mimicked the concept represented in the decoding-the-discipline questions assigned before lecture.

My goals were also informally evaluated on the quality of the discussions and questions during lecture, which became much more organic and lively after I implemented the changes.

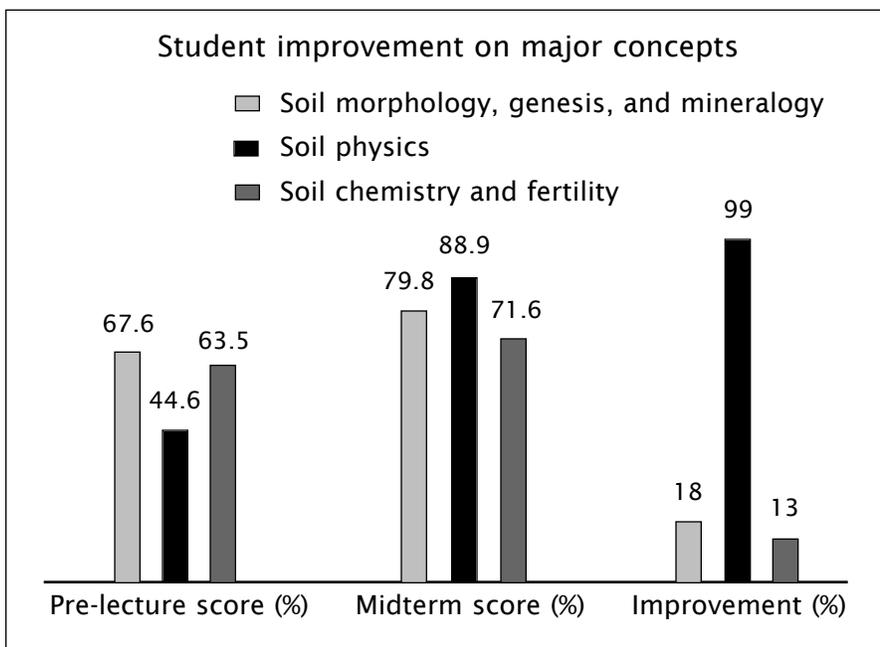
The evolution of in-class discussions during the semester revealed that student understanding of the material had deepened and that many initial misconceptions had been successfully reversed. The difficulty of the decoding-the-discipline questions assigned near the end of the semester hinged on the integration of several sub-disciplinary concepts covered earlier in the course. By the end of the semester, students seemed to quickly recall relevant soil processes and integrate their understanding of the processes on the fly during lecture.

The quality of the discussions, improvement on the precise answers, and also the final project report outcomes far outstripped previous iterations of the course and, indeed, made teaching the course more enjoyable compared to other semesters. Overall, my goals for the course appeared to have been achieved as students seemed much more knowledgeable about and interested in soils than at the beginning of the semester, they could both integrate their knowledge and discuss intelligently specific aspects of each sub-discipline, and they demonstrated their ability to answer a research question related to soils in their final project.

For all three major concepts in the course, student learning improved on midterm questions when compared to pre-lecture questions. What was striking to me was the disparity of

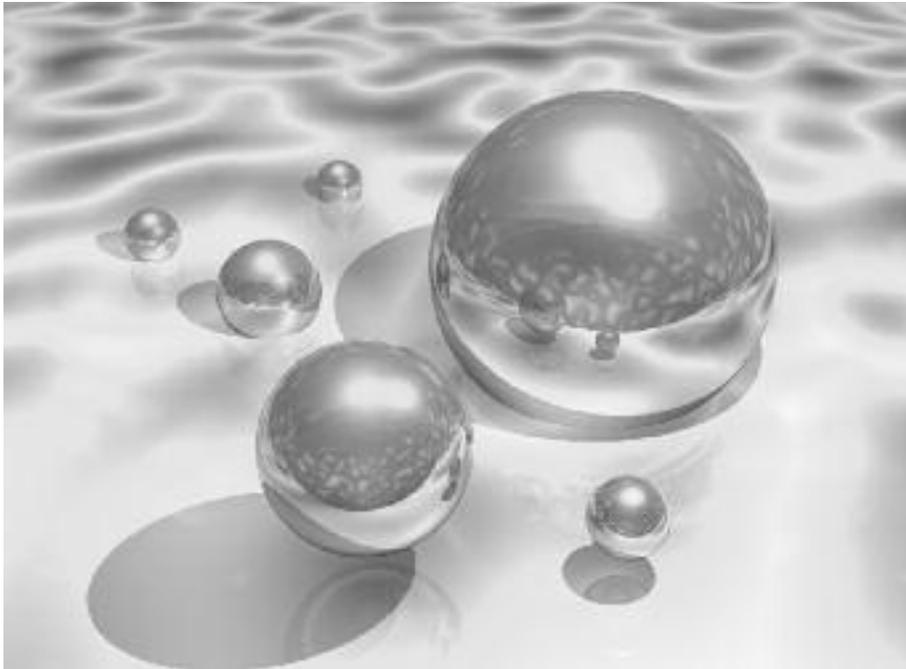
improvement across the major concepts. Clearly, the soil physics section showed the most improvement (almost 100%!) out of the three learning units. However, this is not totally surprising as, conceptually, the soil physics section appeared to be the most counterintuitive to students, and, indeed, questions and discussions during lecture corroborated this idea. I am convinced that student learning in this section can be greatly improved by isolating misconceptions and directly addressing those through peer-to-peer interaction and discussion during lecture. Not every concept is equally difficult for most students; I expect this holds true for concepts in other classes I teach. Further isolating what concepts give students the most trouble, and why, is something I can use as an effective teaching strategy for this and other courses. ♦

*For a complete description of Hirmas' teaching project, see [cte.ku.edu/gallery/portfolios/hirmas](http://cte.ku.edu/gallery/portfolios/hirmas)*



# Goldilocks and Hybridizing Statistics

Jeffrey A. Hall  
Communication Studies



There is a major push at KU to hybridize course content. Blended learning (a.k.a., hybrid) combines the best parts of instructor expertise and face-to-face interaction with the benefits of online learning, including ease of access, instant feedback, and student-directed pacing. One clear challenge of hybridizing is implementation. Where do you start? What model should you use? In this essay, I offer my own reflections on my attempt to hybridize a senior-level statistics course required for the communication studies major. In this essay, I contrast the full-bore approach to hybridization with my own more modest attempt, and present evidence of success and my lingering concerns.

## Background

In my earlier *Reflections* essay “Putting Carts and Horses in Order, Statistically” (*Reflections*

*from the Classroom* 2010-11, vol. 13), I chronicled the redesign of Introduction to Behavioral Research Methods. Since writing that essay, I attended the Teaching Summit (Summer 2011) where Marcia Lovett of Carnegie Mellon presented clear evidence of the effectiveness of using hybrid technology to improve student learning in a statistics course. I was inspired and sought more information about the Online Learning Initiative’s modules on statistics. The modules are interesting and detailed. They provide excellent examples and practice problems germane to common statistical issues, and specific statistical modules appropriate to particular disciplines. At the Summit I also learned of the work of Susan Williams in Chemical and Petroleum Engineering. Her course redesign was transformative. Williams converted all lecture

material into five- to 15-minute videos, complete with video capture, voice-over problem solving. Her students also completed homework problems through the online tool Sapling Learning. By transferring traditional class content to online content, Williams now exclusively uses class time for practicing complex problems, especially ones that students had the most difficulty completing online. Williams refuses to cover any material in class that is available online. She is insistent on this point, so that students adjust to her expectations for how class time will be used.

After considering the OLI toolbox and Williams’ work, I asked myself, could I do what Williams did? Could the OLI be used effectively as a site of information transfer, homework, or practice? Could I better use class time if the basics were covered elsewhere?

## Faculty Seminar

Motivated to answer these questions, but self-aware enough to know I wouldn't make time to address them without support, I participated in CTE's Faculty Seminar in Fall 2012 while teaching my statistics class. At the Faculty Seminar, we began to describe Williams' approach as going *full-bore*. We identified three key parts of going full-bore:

1. Identify the exact learning objectives of the course and prerequisite information needed to meet those objectives. Through a process of backward design, I had boiled my learning objectives down to seven discrete statistical and methodological concepts, so I had that part covered.
2. Carefully distinguish between basic and advanced concepts. Ideally, the basic concepts should be information that can be acquired and practiced online and outside of class.
3. Place the transfer of that basic information online and insist that class time is spent applying and practicing that information, particularly difficult or complex information.

Looking at steps 2 and 3, I found myself utterly daunted. I had a great deal of difficulty figuring out how to deliver class content, short of identifying and recording that material myself or selecting OLI content. Both options presented problems. The first was time. I couldn't see myself spending hours and hours outside of the classroom recording material the way Williams had in the course of one semester (!). The second

problem was that the OLI statistical modules didn't lend themselves to easy integration. Much of this was a matter of breadth and depth of coverage. While exploring OLI content, I discovered I had a Goldilocks problem of teaching statistics: it was difficult to give students the *just right* amount of information. For example, issues germane to sampling vary, based on whether you are random sampling from a population with known parameters or convenience sampling. How do you address some of that information, but not all of it? This was fundamentally a question of how much information should students know. Too much information runs the risk of displacing the topics most directly related to your discipline or course objectives. Not adjusting accordingly risks simply making content load larger, which is a common problem in creating a hybrid class. It was with a heavy heart that I decided to dismiss the *full-bore* approach, at least until I had tried something more manageable.

## Alternatives to the full-bore approach

This led to the question, if not full-bore, then what? I believe that education is a process of getting a larger percentage of your students to learn a larger percentage of course material every semester you teach. Ever since embracing this maxim, I mindfully attempt to move the middle of the class toward a higher level of critical thinking and knowledge acquisition.

I had already taken several steps to hybridize my class. Through working with the CTE, I had a very clear idea of what particular skills I wanted students to possess when they completed the course. I had already created 10 Blackboard quizzes for mastery of simple skills, such as looking up critical *t* values and knowing how to use APA citation. I had created a class handbook that gave students problems that we would work through during class time, and posted the SPSS files and a step-by-step PowerPoint slide show about how to do the work we had done in class for practice and test preparation. These steps had improved class morale, student evaluations, and statistical knowledge and confidence, as measured by an ungraded pre-/post-test I administered every semester.

For Fall 2012, I decided to record six 10-20 minute videos on topics I believe to be central to the course: levels of measurement, experimental design, *z*-scores, *t* tests, correlations, and *p* values. Each video drew from an example problem available in the student handbook but not covered in class at another point. The videos were put online before the lecture content was delivered, but *I did not enforce* when the students watched the videos; I only made students aware of their existence. I used video capture technology that allowed me to work through the problem on the screen while talking about it via audio. With the exception of the levels of measurement

video, the other five videos were applied examples—the most complicated problems we'd do in the class.

### Evaluation of the videos

To find out the effects of these videos, I asked students about the videos on an end-of-class survey. The survey data indicated that about 80% of students had watched all six videos (some videos were watched by 97% of students). Students primarily used the videos for test preparation (65-75%), and students believed that the videos were helpful for that purpose (90-100% agreement with that statement). Very few students used the videos to prepare for class (6-10%). I also asked what students did while watching the videos. Regarding note taking, students took new notes while watching the video 50-62% of the time, reviewed class notes 32-44% of the time, and watched without taking notes 20-28% of the time.

I was curious when and whether students attempted the practice problems covered in the video and available in their handbook. I had stated explicitly in text, out loud in class, and on the first moments of the video to try the problems before watching me go over them. Unfortunately, only 20-36% of students did the problem before, 50-56% tried the problem during the video, and 42-56% tried the problem after watching the video. All in all the feedback about the quality, pace, and clarity of the videos was very positive.

I was curious whether any of these practices had an effect on class performance. As a whole, the class performed better than the class I had taught the previous semester when everything was the same except the videos: post-test performance (2.6 / 7 in Spring 2012 improved to 3.6 / 7 in Fall 2012) and final exam scores (70.2% Spring 2012 improved to 73.3% Fall 2012).

**There is good evidence that using video capture technology to create videos that help students review key concepts improves test performance and knowledge acquisition.**

For individual students, I explored whether the way they used the videos was related to their final grade and post-test knowledge (using OLS regression to control for pre-test knowledge and demographic characteristics).

A very clear pattern emerged. Students who had higher final grades and greater post-test knowledge used the videos to review class notes and tried to solve the problems before watching the video. Both activities were positive predictors of outcomes for each of the six videos. There was some evidence that using the videos during the semester (not in preparation of the exam) was negatively correlated with final grades and post-test knowledge. This suggests that students may have used the videos to try to catch up for missed class.

### Reflections

There is good evidence that using video capture technology to create videos that help students review key concepts improves test performance and knowledge acquisition. These videos were most effective when students reviewed notes *during* and attempted to solve problems *before* watching videos. This shows that a less

than full-bore approach can yield measurable improvements and might be met by students with appreciation and widespread adoption.

Yet the question remains, is this the best use of hybrid technology? I have mixed feelings. On one hand, if the goal is better performance, the evidence suggests that videos are a high-impact form of test preparation. All in all, the effort I put into recording and posting the videos on Blackboard was minor compared to the improvements that I saw. However, the evidence was inconclusive about whether good students just use the videos more effectively than poorer students (despite controlling for pre-test knowledge).

On the other hand, class time was not really affected by this modest attempt to hybridize. For years, I have been changing my use of class time to spend

more time practicing, talking to students, and trying to problem-solve on the spot when certain concepts are giving students trouble. My use of hybrid technology did very little to improve students' preparation for class.

I can offer two take-aways from all of this. The first is about fit between course concepts and online material. For me, it was easier and more productive to create online material to fit my course than to try to integrate existing material, such as from OLI, which was an imperfect fit. The second take-away is providing immediate gratification and consequences for students. I believe students will use the online material only when they have to. They *have to* when there is a test or when you insist, as Williams does, that you will not cover anything in class that is covered online. I believe to get anything out of online information transfer, it must have immediate consequences that students are motivated to avoid. This requires an instructor to have confidence in the online material, have feedback from the online material to determine where students are struggling, and have a firm hand to stay the course in the face of student opposition. Truly using blended learning is not just an adjustment for faculty, it is an adjustment for students. It puts the onus of learning back on their plates.

The next step is figuring out how to further improve the use of hybrid technology and class time. This leads me to my final

point of reflection. If you look at the second step of using blended learning, the basic material, the information transfer, the eyes-on-pages-type learning must come first. In my attempt at course redesign, I failed to follow step 2. I put the most difficult material online. No wonder it was used for test preparation. In step 3, class time should be used to practice and apply the basics, then move to the complex. In the future I will identify and capture basic material from lecture and put it online. Then, I need to ensure that students are watching and practicing that material, perhaps by requiring a Blackboard quiz and refusing to deliver the content otherwise.

My future plans for the six videos from Fall 2012 is to give them a due-date (with mild sanctions) before the test, which will allow at least some time in class to problem-solve with students and trouble-shoot difficulties. By freeing up class time earlier in the semester and by putting lecture material online, I will have more time to spend making sure students are learning, not just on the test, but in class too. ♦

# Shaping Graduate Students' Methodologies and Professional Values through Dialogue, Writing and Group Projects



**Chad Kraus**  
Architecture

Theory and Context of Architecture (ARCH 630) is a required lecture course in the Master of Architecture degree program. Typically the course enrolls between 50-65 students and is comprised of seniors and graduate students. Since it is the only required course in the area of theory within the architecture department, it covers a lot of ground. The course examines several architectural theories and considers the environment as a cultural medium and product of a socio-cultural process that expresses values and ideas. The aim of this course is to make explicit the way architects have understood their own work as socio-cultural phenomena and thus provide students with the tools necessary to shape their own methodology and value system.

I began teaching ARCH 630 in 2010 when the course structure was still in question. In previous manifestations, it was taught as a small seminar in a few sections; however, this was no longer possible due to the class size and the decision to teach it as one section. Ideally, I wanted to teach this class as a seminar centered on discussion. This posed the most significant challenge in re-designing this course—how to preserve qualities of a seminar in a larger lecture course. My primary goal was to develop strategies that allowed me to occasionally transform a mid-size lecture class into an intimate seminar which in turn would provoke dialogue, increase student engagement, and foster critical thinking. I scaffolded the assignments to develop critical

thinking skills, which in turn would improve students' performance in the final project. I also focused on developing more effective ways of assessing the quality of critical thought.

This essay describes the changes I made to this course to encourage and facilitate more professor-student and student-student interaction beyond the occasional question prompt, and to move beyond the imposing atmosphere of the lecture hall and stimulate an intimate conversation where students feel free to question, defend, expand upon, and reflect on the subject matter. Finally, it describes my framework for assessing critical thought.

#### Four changes

To increase student engagement and maximize learning, I made several changes to the class structure during the Fall 2011 semester. Because writing is linked to thinking (I always tell my students in design studio that drawing is thinking) and is an important skill for architects entering the profession, writing took on greater importance in assignment redesign and class structure.

Previously, I had relied on a series of exams and a final project to assess learning outcomes. I retained the final project, replaced the exams with quizzes, and added an essay component as well as in-class activities to foster and assess critical thinking. Each assignment/activity allowed students to develop the skills needed to be successful in the next one.

#### 1. Quizzes

In the previous iteration of this course, I found that the exams did not do a good job assessing students' understanding of the readings. Most students relied on my class lectures instead of actually reading the articles provided. As a first step in the scaffolding process, I replaced the exams with quizzes. Rather than gauging students' comprehensive understanding of readings, the quizzes assessed their familiarity with the texts. Students had to complete a quiz before every class based on the reading material and on the previous lecture. With quizzes, students could also reflect on their level of understanding and use the classroom as an opportunity to raise questions and clarify their uncertainties.

I realized that before measuring or expecting demonstrations of critical thought, I needed to foster it. I designed the quizzes not only to help enhance in-class discussion (which I believe is also important for developing critical thinking skills) but also to serve as a baseline against which I could assess where students stood and what areas needed more work.

#### 2. In-class activities

To encourage classroom engagement, I increased in-class activities. At the beginning of each class, I identified three or four students to be the "daily experts." The daily experts were required to ask questions and make comments in class and/or post comments on Blackboard. The advantage to this arrange-

ment over the traditional model of randomly calling on students is that it avoids putting them on the spot and allows them to respond when they feel compelled by the content and not by my whim. This served as a quantitative mechanism for evaluating participation. To further encourage participation and critical thinking, I would pause during one of the two lectures each week and ask students to form "buzz groups" of four to five members to work on an in-class activity. For one activity, each group had to consider both sides of a debate on modern architecture (one proponent emphasized increasing standardization while another emphasized the creative individual and de-centralization) and write a letter of support for one or the other. After reading out loud several of these responses, the class engaged in a debate. I did not assess the letter of support as I felt that typically this activity was sufficient to engage them. Instead of just recalling different content, this activity afforded them a chance to reflect on course content and, through a dialogue, foster critical thinking.

#### 3. Essay assignment

To assess the quality of their critical thought, students had to complete an essay assignment. Students were required to synthesize several readings across the semester and develop their own perspective on these readings. Rather than summarize the content of the readings, this assignment aimed at developing

their writing as well as their analytical skills. Furthermore, it encouraged students to narrow their topic of interest (which would determine their final project) and do an extensive and in-depth analysis of that topic. Finally, the essay assignment served as a counterpart to the final project, which required students to apply the skills developed in writing the essay to a different medium—film. It would also absorb some of the research load of the final project since students would have already done some preparation in writing the essay. I expected the quality of the films to improve, as they would now be based on more in-depth analysis compared to earlier iterations of the assignment.

#### 4. Final project

Working in teams of four, the final project for this course was to create an eight-minute digital narrative based on a careful reading of a work of architecture as well as the intentions of its creator within a specific theoretical framework. The project was divided into four parts: subject, script, short film, and reflection. Students submitted these parts throughout the semester. The focus was on practicing skills of analysis, application of concepts, and the ability to place the narrative within a robust theoretical and historical context. This assignment instilled in students the value of theoretical discourses in the making of architecture as cultural artifacts and allowed them to illustrate critical think-

ing skills while building relevant graphic and digital skills.

#### Student performance

Although it is difficult to quantify changes in student performance compared to previous course offerings (largely due to the fact that many aspects of the course changed as well as the methods of assessment), in general I perceived significant benefits to learning. Specifically, the quantity as well as quality of in-class discussions improved dra-

**It is clear that students completed the course with a much better understanding of theoretical constructs relevant to future practicing architects, as well as a firmer understanding of the purpose of theory, or “what it is good for.”**

matically, resulting in increases in the demonstration of critical thinking skills. It also made the course more fun, for me as well as the students.

The quizzes positively impacted familiarity with course readings as demonstrated by increased student participation in class discussions and more direct references to the assigned readings.

The essay assignment proved to be a valuable exercise in terms of preparation for the final project, as well as a demonstration of critical thinking skills. Essay theses were expected to draw from course readings; however, in the case of the stronger essays—which were exceedingly frequent—the thesis topics tended to transcend the specific framework of course

themes to forge new intellectual discourses. In many cases, students demonstrated the ability to move beyond absorbing and re-presenting existing theories to synthesizing course content within their own theoretical constructs.

The intellectual content of the videos tended to be uniformly higher than in the previous iteration of the assignment. Students frequently demonstrated a thorough understanding of the theoretical lens through

which they interpreted the chosen work of architecture. In one particular case, students were able to understand the work of architect Louis Kahn through three distinct and surprisingly nuanced perspectives drawn from class discussions, all the while imbuing the work with a very approachable and humorous character. In another example, through carefully composed original and borrowed footage, a minimal amount of text/narration, and a well-choreographed musical complement, students were able to argue convincingly and emotionally that the work of architect Eero Saarinen signaled a new trajectory in the ever-expanding canon of Modernism. Their work attempts to pull back the curtains of dogma to reveal a

more humane understanding of Modernism. While intellectual rigor increased, technical execution remained constant or, in some instances, declined. I believe this was due to the two projects competing for students' limited time resources. In the future, I intend to increase the extent to which the two projects are scaffolded to build upon their successful cooperation while reducing conflicts.

Taking the combined student performance in the essay assignment and film project, coupled with the demonstrated engagement in classroom activities, it is clear that students completed the course with a much better understanding of theoretical constructs relevant to future practicing architects, as well as a firmer understanding of the purpose of theory, or "what it is good for." In this regard, students have frequently met or exceeded my goals for the course.

### Reflections

One of the most important benefits that came out of this course redesign was that students began conversing with each other more. It was not as instructor-heavy as a traditional lecture course and incorporated student-led discussions that are common in intimate seminars. The redesign allowed the course to be more learning-oriented rather than instructor-oriented.

Increasing application and demonstration of critical thinking skills is essential for future designers and problem solvers. Knowledge of existing theoreti-

cal concepts in architecture provides students with a valuable framework for addressing a variety of complex problems. In turn, the ability to synthesize this knowledge will provide students with tools to formulate a specific set of principles guiding their own work. This fundamental skill is often applied in the design studio without any explicit cultivation. Yet it is necessary to instill in future architects guiding principles, convictions, and critical positions if we wish to advance the state of the discipline. ♦

*For a complete description of Kraus' teaching project, see [cte.ku.edu/gallery/portfolios/kraus](http://cte.ku.edu/gallery/portfolios/kraus)*