

Reflections from the Classroom

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Overview

As members of the academic profession, we recognize every day the ways that research and teaching are interdependent. Both activities are central to our work as faculty members in a research university, and it is sometimes difficult to say for sure whether there is a clear boundary between the two professional domains.

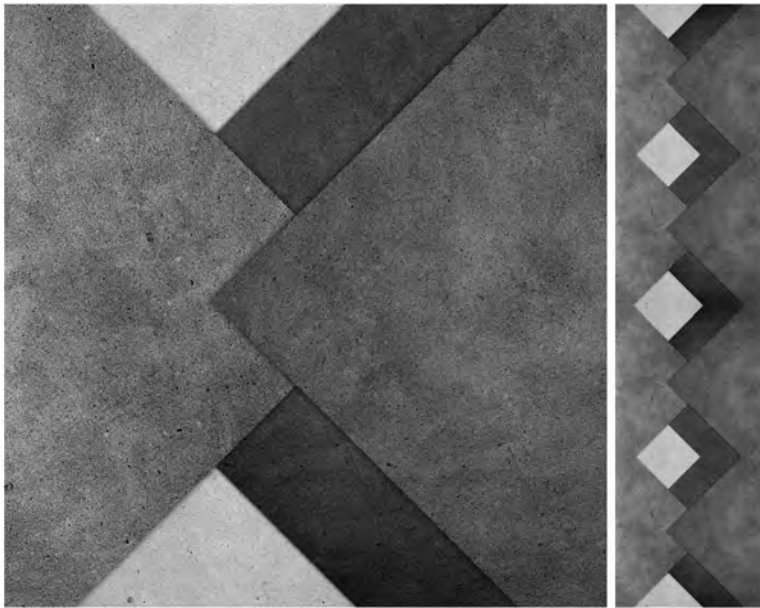
Most often we talk about how research informs teaching. In general, the content of our courses is based upon our synthesis of a wide range of intellectual work inquiring into the nature of the world we live in, the activities of people and other creatures, and the expressions of experience that reveal meaning in our lives. With that scholarly body of knowledge, our teaching is richly informed by the best insights we can identify.

Sometimes the influence can go in the other direction, when an idea or an observation that emerges through teaching catches our imagination. In pursuing it further, we discover a new question or a new perspective on old questions, and that can give rise to an additional line of inquiry. These insights can appear while preparing for class, as a response to a question or challenge from a student, or through analyzing a complex problem along with students.

Through the process of this year's Strategic Initiatives, there have been many generative conversations in which researchers from a wide range of fields shared their ideas, questions, and interests. On many occasions during those sessions, faculty members observed that overlapping topics would make for good interdisciplinary courses, and sometimes complex research problems were recognized as great opportunities for students to learn sophisticated ways of thinking and of using evidence to advance knowledge. It was even suggested that collaboration on interdisciplinary courses would be a valuable way to generate and more fully develop ideas for interdisciplinary research programs. Teaching together would be a good way to reach across the typical separation marked by the locations of our offices, labs, and libraries.

This conversation was so powerful and energetic that we asked several faculty members to reflect on their experiences during this year-long dialogue. Danny Anderson provides a coherent overview of the intellectual benefits of these collaborations, and the other essays are examples from a wide range of fields. In each case it is clear that engaged forms of interdisciplinary or collaborative teaching are richly connected to and support the development of emerging ideas for research and scholarly inquiry. These reflections point to the synergistic value of interdisciplinary teaching as a cauldron for new research programs.

Dan Bernstein
CTE Director



Intersections of Teaching and Research: A New Vision of Interdisciplinarity

Danny Anderson
College of Liberal Arts & Sciences

with Ann Martinez
CTE/English

This is an exciting time for us at the University of Kansas to see where we are going as a university in terms of interdisciplinary research, and at the same time to become more aware of what this change can mean as we look at new ways to think about interdisciplinary teaching. We are taking a moment to pause and ask ourselves what our intentions are regarding our teaching.

The process of strategic planning is opening up opportunities for faculty members to think about their teaching. In Fall 2011 and Spring 2012, we had four major research summits explicitly designed to address research. At the same time, the summits included opportunities for faculty members to build their networks with each other and explore ideas. I was repeatedly impressed by how quickly fac-

ulty members wanted to talk about the relationship between research themes and teaching.

My experience from listening to the conversation at the summits is that the phrase *interdisciplinary teaching* often was used to talk about three facets of our focus:

1. The idea that interdisciplinary teaching is team-based was a way for individuals to explore relationships among their ideas and to think about the community of people who work together. They not only wanted to discuss how they could collaborate on research outside of the classroom, but also to think about how they could work together to share ideas with students in innovative ways. The other side of interdisciplinary teaching is that faculty members were often referring to teams of students who also could be interdisciplinary. When you have an inter-

disciplinary seminar or class, students who select into that course represent a range of interests as diverse as those of the faculty, and that sense of what a team can bring to a problem, both in research and in teaching, is really crucial for the conversation we are having.

2. Through interdisciplinary teaching and interdisciplinary research, we are looking at ways to think about problem solving. Many problems have complex facets that cannot readily be addressed by a single discipline. Researchers working together to solve a problem will bring different perspectives—our intellectual imagination, our opportunities for innovation, all will converge on problem solving. This is different from the usual, more abstract way people talk about interdisciplinarity, thinking about the traditions of a university, rather than the immediate benefit.

3. One of the subtexts of the conversation had to do with the tensions between what in many fields is called basic research versus applied research. This was reflected in the titles of our four strategic summits: In “Sustaining the Planet, Powering the World,” we have the idea of a team coming together and solving a problem, but it has a very real application, while at the same time there is a lot of basic research, a lot of theory, a lot of original intellectual thinking that is needed to answer some of those questions. “Promoting Well-Being, Finding Cures,” “Building Communities, Expanding

Opportunities,” and “Harnessing Information, Applying Knowledge” were similar, in that there was a wide spectrum of connections that included the theoretical and the basic, all the way through to thinking about the translational or the applied.

In my role as Dean of the College of Liberal Arts and Sciences, I feel that those three aspects of teaching are crucial in terms of ways that we approach things when individuals ask about the benefits of the liberal arts and sciences today. There

The world today is an international world, it is a globally connected world, it is a world of incredible diversity, and we need to ensure that our students have the right kinds of literacies to thrive wherever they are, whatever they do, in the 21st century.

are so many ways that we talk about what liberal arts and sciences do to prepare an individual for life—they give us remarkable equipment for living, and at the same time they are very practical in terms of helping us be prepared to adapt, change, and solve problems that we confront in any situation. This kind of problem solving is vital to the future of the liberal arts and sciences. The ways that we create dichotomies between theory and practice, or basic and applied, are not always accurate representations of the range we have to develop knowledge, use knowledge, and the ways that we are talking about interdisciplinarity in the context of our strategic planning. Interdisci-

plinarity strengthens the full spectrum of ways that knowledge in the liberal arts and sciences *can* be used and *is* used every day.

Right now we, at KU, are engaged in the process of thinking about how we can document our intentions regarding the outcomes of our courses (learner outcomes). This project is closely related to our upcoming reaccreditation as a university, and it is very important to note how we are having this conversation—preparing for the

process in a manner that will truly benefit our institution because we are putting our students at the center of that question. How can we, upfront, identify the goals for the course, how can we gather evidence of our students’ ability to achieve those goals, how can we use that evidence in a feedback loop to make adjustments in the course and in future iterations, and how can we link those goals to the broader conversation about what is being called now the KU Core Curriculum?

The world today is an international world, it is a globally connected world, it is a world of incredible diversity, and we need to ensure that our students have the right kinds of literacies to thrive wherever they are,

whatever they do, in the 21st century. This means that our students need to be prepared. Our students need to have new kinds of literacies for knowing how to evaluate and make decisions and judgments with the incredible quantity of information that will impact all of us in the course of our lives, every-day. In our world it is necessary that our students, as they become the decision makers, the policy makers, the leaders of the future, can analyze, contextualize, and appreciate all of the values and beliefs different communities have.

One of the things that I hope comes out of the strategic planning effort is that we, as a university, as faculty members in the College, will be able to describe the overall student experience from end to end, and ensure that we are achieving our goals for each KU graduate. As a university we should ask ourselves, how are we supporting our students' transition into the next phase of their lives? At the same time, I think it is important that we be intentional about having our students know how to deal with setbacks, be willing to take risks but not lose faith in themselves when something fails, and to know that they can learn from failures and go on to succeed at the next point. Tying all these different threads of interdisciplinary teaching together, keeping in mind the overarching student experience from before they arrive at KU to after they leave KU, is going to be one of the real tests of our success in meet-

ing the challenges of the 21st century. ♦

Discoveries Happen at the Interface of Disciplines ... In Classrooms as Well as with Research

Elizabeth Friis
Mechanical Engineering

It is now a commonly held view that most discoveries will happen at the interfaces of traditional disciplines. Research funding is directed toward multidisciplinary collaborations, and work in these fields is growing rapidly. Our own KU Strategic Initiatives were crafted so that we will embrace and foster the multidisciplinary present and future. It is logical that we should be preparing our students to flourish in this multidisciplinary environment while still teaching them the required basic knowledge and skill sets in their respective disciplines. However, most of our classes are still taught within the disciplines, with students from a specific major working with other students who have similar skill sets and backgrounds.

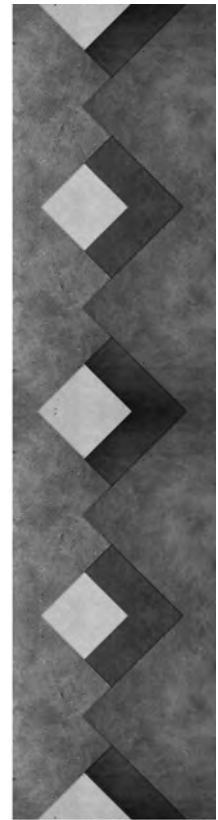
Once per year since Spring 2005, I have taught a multidisciplinary course titled ME760, Biomedical Product Development. I solicit real project concepts from faculty, and in the class we explore the commercial potential of the concepts and the best research pathways to help patients in the most efficient manner. This process inherently involves investigation of both the bioengineering and business aspects of the project concept. Student teams pretend that they are the technology founders of start-up companies around the product topic. Sometimes the students find that the product topic has little potential future. Other times teams have come up with a new application of the basic technology that meets patient needs

and may have a better chance of translational success. Either way, the faculty member whose translational research is examined gets feedback about the commercialization potential of his or her idea.

Students of any major of senior standing or higher can enroll in this course. I have had students from several different areas of engineering, business, and industrial design enroll. Including students from different disciplines greatly enriches all students' experiences and teaches not just what I lecture about in class, but also how to value the input of other disciplines and points of view. However, throughout the years, I have had varied success in this endeavor. This class has always been just a little harder for me

to run than my other courses, though it has always been very rewarding. I've tried collaborating with others from around the university, and the best collaboration has been with Professor Wally Meyer, Director of the KU Center for Entrepreneurship. We are currently working to improve our two complementary courses, ME760 Biomedical Product Development and ENTR750 New Venture Creation and Business Plan Development, and I am excited about where we might go on this endeavor.

In reflecting on why teaching students from different disciplines has been difficult, it recently occurred to me that the same challenges of doing multidisciplinary research exist in the educational realm. Last fall, I spoke about multidisciplinary



research at the KU Summit on Healthcare. In designing this talk, I identified three major challenges from my 25 years of experience working with individuals from other disciplines:

1. We speak different languages;
2. We look at problems differently; and
3. It takes time and extra energy to trust and respect each other's skill sets.

These same challenges are exactly what I have faced in attempting to build courses between departments and schools. It is not surprising that these challenges are also what students discuss with me as issues they face in their multidisciplinary project teams.

While the challenges have been great, the rewards have also been high. I see students look at their work differently by the end of the semester. Some students have emailed me after they have taken full-time jobs and indicate that this class helped prepare them for the workforce. The class is not perfect in any way, but I am hopeful that the entrepreneurial saying that "failure is compost for success" applies to this course. I always look at how I can learn from what didn't go as planned to improve the quality of the experience for students and help them learn about multidisciplinary innovation.

Some of the ideas that I have used that have helped me improve the quality of student experience are the same strategies that I use in my own multidisciplinary research collaborations. The following thoughts

will help guide my thinking as I look forward to improving multidisciplinary collaborations on ME760:

Find common areas of interest to enhance multidisciplinary collaborations. Professor Meyer and I have a common interest in providing real-life experiences for students to learn to work in teams with others of different skill sets, just like in real start-up companies.

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3. It takes time and extra energy to trust and respect each other's skill sets.

Collaborators must have complementary goals and skill sets. Professor Meyer's tremendous experience on the business side of start-ups is fantastic, while mine in translational research, SBIR proposal development, and medical device development helps us to achieve the course goals.

Hard work is required on both sides to learn enough language to communicate. The languages of technology and business are not the same. I have worked hard to educate myself on how to communicate in the business world, and Professor Meyer has done the same in the technology world. We both constantly keep trying to clarify issues and trust that our intentions are good. We ask questions, get student input, and

constantly work on understanding each other's point of view.

Extra time and energy is required for multidisciplinary collaboration. It does take extra time and energy to lead a multidisciplinary course compared to more traditional classes. Attention to student needs and differences is important. In connecting our students, we have identified that a common course time for sharing some lecture

periods and team coordination would help tremendously, so that we can share interactive opportunities while minimizing struggles with timing and external meetings.

Most importantly, mutual respect is essential. I cannot emphasize this enough. If there is not mutual respect, trust is broken down. Without trust, this type of multidisciplinary course and connections between disciplines just won't work.

Teaching this multidisciplinary course has helped me to recognize and reinforce these principles in my research. I believe it has helped me to better "practice what I preach" in the research lab and has, in many ways, been as beneficial for me as I hope it is for the students who take the course. ♦

The Strategic Initiative Summits: A Springboard for Classroom Collaborations



Donna Ginther
Economics/Center for Science,
Technology & Economic Policy

Many of us have participated in the four Strategic Initiative summits this past academic year. I was a member of the planning committee for Building Communities and Expanding Opportunities that included faculty from the social sciences and humanities and the schools of social work, journalism, and education. Our planning committee proposed four research clusters: Addressing Disparities and Promoting Social Justice, Building Communities and Opportunities through Education, Building Communities Locally and Globally, and Migration and Changing Communities. My own research and teaching interests align with the first research cluster and center on the broader issues of socioeconomic inequality. The Strategic Initiative summits provided an exciting opportunity to share our mutual research interests with colleagues across campus. The summits have also provided an opportunity to leverage

our research interests in the development of new courses motivated by the same challenges we face in society.

For example, consider the pressing question of socioeconomic inequality. My research has been united by the common theme of understanding the determinants of socioeconomic inequality. My dissertation examined earnings inequality and the effect of schooling on earnings, and my current research focuses on the gender and race/ethnicity differences in scientific careers and research funding. As a junior faculty member, I developed a course related to these broad interests—Income Distribution and Inequality. It was designed to be a small, interdisciplinary course that incorporated both writing and analytical assignments. The first half of the semester was spent reading economists and philosophers and answering the big question: equality of what? Answers to this question ranged from income and well-being to

education and opportunity. Each class period, students discussed the readings and wrote responses to the many philosophical perspectives they encountered. The first half of the course culminated with a paper that required students to synthesize the philosophical perspectives on inequality from the readings. The second half of the course moved into the statistical analysis of poverty, income, and wealth inequality and public policies such as welfare, tax policy, and affirmative action that are designed to address inequality.

As you can see, this is not a typical economics course that emphasizes the theory of the consumer and the firm. Although most of my students have been economics majors, their response to this course is typified by a former student: *When I came to KU, I had no desire to attend graduate or professional school. Coursework like that found in your Income Distribution and Inequality class is what made me realize I want to learn and practice law. I found the analysis work and the resulting classroom discussions and arguments to be incredibly fulfilling.*

I believe that courses such as Income Distribution and Inequality that address the larger issues we face as a society can motivate our students and enhance our research. For example, each of the research clusters we proposed in our report on Building Communities and Expanding Opportunities could be developed into a freshman seminar. In addition, I believe

these courses should be taught by teams of interdisciplinary faculty. Although each discipline has its unique perspective on the pressing questions of the day, I am convinced that a single disciplinary perspective cannot fully embrace the complexity of these issues. The strength of the strategic summits was in bringing together faculty from disparate departments and schools within the university

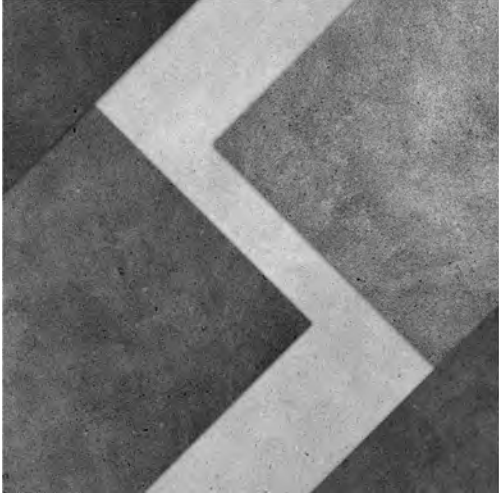
The strength of courses developed from the Strategic Initiatives depends on bringing faculty together so that the whole is greater than the sum of the parts.

and uniting us with our common interest in large and pressing research questions. The strength of the freshman seminars and courses developed from the Strategic Initiatives also depends on bringing faculty together so that whole is greater than the sum of the parts.

Although Income Distribution and Inequality was a natural outgrowth of my research interests, I believe it could be a much better course if I partnered with colleagues who had related interests but a different disciplinary perspective. As an economist who specializes in empirical research using large data sets, the first time I taught this course I had to move beyond my training to teach myself how philosophers and other social scientists viewed the difficult problem of inequality. Reading and teaching the philosophical literature on

inequality is outside of my area of expertise, and I struggle with that material each time I teach the course. Team-teaching this course would serve to strengthen my own knowledge of the material and provide a fresh, new perspective on these larger research questions. Consider the possibility of having a team of between two to five faculty members developing courses based on their disciplinary per-

spectives on broad and pressing issues related to the Strategic Initiatives. These courses would serve the dual purpose of bringing multiple disciplinary perspectives together at the same time and place for at least a semester, and fostering collaborations inside and outside of the classroom. As the administration makes changes in response to the Strategic Initiatives, I encourage our leaders to provide incentives for creative collaborations in classroom teaching that have the potential to solidify and strengthen the university's research mission. ♦



Engaging Students in Thinking About Research on Evolutionary History

Chris Haufler
Ecology & Evolutionary Biology

KU is a research intensive university, and KU educators have an opportunity to help students discover how research generates knowledge. As educators, we are challenged to develop the best ways to teach our undergraduates about the fundamentals of a field *and* to apply those fundamentals in thinking like researchers. A course that I have taught for more than 30 years offers the possibility of redesign to meet this challenge.

In the world of biology, asking and answering questions about earth's natural diversity requires a solid grasp of fundamental principles and a working understanding of basic facts. In biology classes, we typically use tree-like diagrams to depict current understanding of relationships among and evolutionary history of the diversity of life on earth. In introductory classes, we tend to present these "evolutionary trees" as static facts, without sufficient attention to the methods used by scientists to develop these graphic representations of hypotheses about historical relationships.

Upon arriving at KU in 1979, I worked with one of my colleagues, Edward Wiley, to team teach a course for undergraduates that would survey the diversity of life on earth, and introduce these developing biologists to the methods used to reconstruct the history of life on earth. Since then, the scientific methods used to develop hypotheses about evolutionary history have changed; some hypotheses have been supported, and some have been revised. Just as significantly, the teaching methods we use to help students learn about the science behind these hypotheses have continued to evolve, as well.

Although the diversity of life on earth is inherently fascinating to most biologists (and most people, regardless of their other interests), teaching students the scientific methods used by evolutionary biologists to develop and test hypotheses about the history of biological diversity presents complex problems. Consider these components:

- Despite the fact that humans have been cataloging species

diversity since our earliest ancestors began differentiating food from predators, we still do not have a firm estimate of the number of species on earth. Because much of the planet is unexplored (much of the diversity in tropical forests, deep sea habitats, and soil-bound organisms remains mysterious), we can give only broad ranges when referring to how many species exist (10-30 million is a reasonable answer).

- About 1.8 million species have been catalogued to date. At the rate we are currently identifying and naming new species, it is likely that most of those still unclassified will have gone extinct before we discover them, likely through human-caused habitat destruction and pollution.
- Reconstructing the history of life on earth can be compared to tracing family genealogy. Students know how difficult it is to identify their ancestors back a few hundred years; when geological time scales are considered, establishing the progenitors of modern species can seem daunting. Nonetheless, with as much accuracy as possible, scientists try to discover and characterize diverse ancestors that have been extinct for many millions of years.
- The kind of features that are used to determine relationships among species ranges widely, from macroscopic to microscopic characteristics, and in more recent years, biochemical constitution and

DNA sequencing. Comparing the information obtained from analyzing such features can generate conflicting results that must be weighed and critically considered.

To think like research scientists, students need to:

- Develop a solid background about how biologists distinguish different species;
- Identify characteristics used to postulate that some species are more closely related to each other than they are to other forms of life; and
- Know what to do when characteristics providing informa-

If we are to reach the goal of helping students grasp how scientists develop and test hypotheses, we need to change how we present fundamental principles and how we engage students in posing and testing hypotheses.

tion about species relationships are in conflict.

Acquiring the capacity to distinguish groups of species from each other and the knowledge necessary to show historical relationships among such groups is not trivial. If we are to reach the goal of helping students grasp how scientists develop and test hypotheses about such relationships, we need to change how we present fundamental principles and how we engage students in posing and testing hypotheses.

Using web-based adaptive tutorials, we are exploring ways to allow students to work on their own to obtain a foundation about the current diversity

of life on earth. In-class sessions would build on this foundation, and students would work in groups to compare critical features of organisms and look back in time to chart the ancestry of biological diversity. Exploring research methods through group work will enable students to leave class with a hands-on demonstration of how scientists study evolutionary history. Although some students in past iterations of this course did gain that deep understanding, too many left with a superficial appreciation of earth's diversity and no substantial

understanding of the basic research that results in the tree-like depictions of biological diversity. We would like to increase the percent of students who learn about and appreciate biological diversity *and* who understand how scientists chart the genealogy of that diversity through posing and testing hypotheses about evolutionary history. Enabling students to work at their own pace to build a knowledge base about diverse organisms will give them the tools necessary to address questions about relationships among the organisms. We are excited about redesigning our course to help more students think like research scientists. ♦

To Challenge, Engage, Inspire: Integrating with Object-Centered Teaching and Learning

Celka Straughn
Spencer Museum of Art

with Ann Martinez
CTE/English

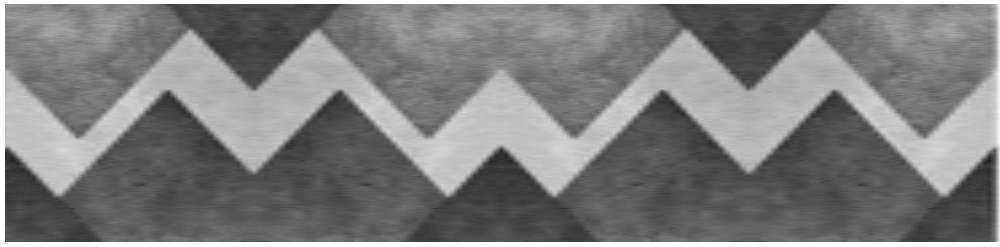
KU's Strategic Initiatives call on us to challenge, engage, and inspire as we build scholarly communities from many disciplines and educate leaders to address global challenges and societal issues. We are charged to provide students with unique experiences to position them as drivers and innovators, and to prepare them for lifelong learning and success. One way to meet this challenge is by implementing object-centered teaching and learning into KU courses. With its extensive and diverse collection, the Spencer Museum of Art supports interdisciplinary exploration that aligns with the goals of the Strategic Initiatives. Through cross-disciplinary learning experiences that invite inquiry and conflicting interpretations, students acquire new and multiple frameworks for understanding; they make rich connections across ideas, disciplines, and modes of learning; and they return to the classroom or dorm room enthused and inspired.

The holdings at the Spencer Museum of Art (SMA) currently number more than 38,000 artworks and artifacts in all media. These extensive resources make the SMA uniquely positioned to encourage interdisciplinary exploration at the intersection of art, ideas, and experience.

One such ongoing interdisciplinary connection is with a professor from the School of Business. When meeting her informally, a few years ago, and discussing the museum's availability for engagement with other disciplines, her response was, "I teach accounting, so there's no real connection." This sparked further conversation and a subsequent meeting. She has since brought in a number of classes, working closely with our museum staff. For one course, Introduction to Accounting, her students met with me, with our curatorial staff, and with some of our development staff; we talked about the different ways our collections are funded by charitable giving, the ways that works of art from collections might speak to donors, and the acquisition of works of art. At first, students were skeptical, and they let that be known to her, but most students left having asked many questions, having involved themselves in the discussions in ways I don't think they were expecting to before arriving.

When she brought in a group of law students from another accounting course, we focused on legal issues pertaining to the objects—like provenance, production, and consumption, as well as the institution of the

ating Art Learning



museum and how it operates. When she brought in students from her service learning course, the tables were turned: they taught us—museum staff and some art history students—how to read audit reports and complete non-profit tax returns. It was an engaging way for the students to further our reciprocal relationship, complete their service-learning requirement, and develop a lesson plan.

In some cases, faculty members contact us because they have seen a particular content connection between an exhibit or an object and a class they are teaching. One example is a professor from health, sport, and exercise sciences. She wanted us to work with students in her Stress Management course in thinking about different ways in which we look at Buddhist art. We also examined nature and landscape, using objects as prompts to think about ideas, to engage with the works of art, and to spend more time concentrating. She contacted us later, which is not uncommon, to share that the works and ideas discussed in the museum session were themes that continued to surface in class discussion throughout the semester. It is often the case for students that being in a different place, a different physical environment from the classroom, is a stimu-

lating experience; their interest is not only piqued by the objects they are examining, but by seeing other works, having something concrete, visual, to discuss. Students tend to be quite good about connecting their museum experience to the ideas of a class.

In some cases, connections with the museum expand to connections between various disciplines, and the work we do with students in one course can successfully echo with another. We were able to share the work done for the Stress Management class with a class on Stress Reduction from the Department of Theatre. There is a great flexibility with the objects in our collection, and we like to be challenged to make connections and to draw these connections among the various disciplines.

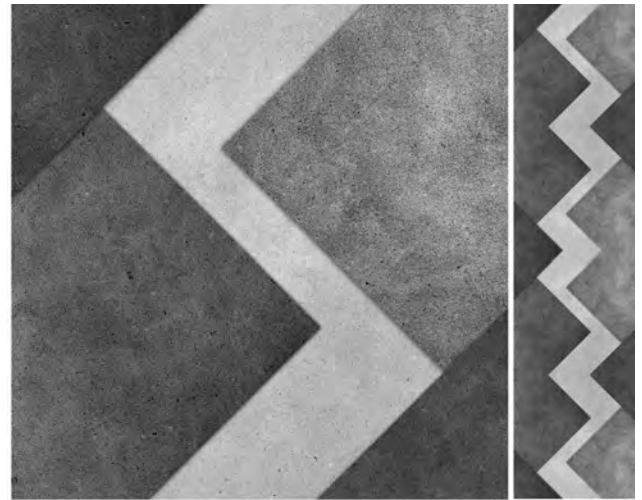
On some occasions, the connections between the object and the discipline extend into other aspects of the art object. For instance, a professor from economics, teaching his students about innovations and technology, had them examine the materials of a work of art and the technique associated with the work, and compare it to different objects across different cultures and different periods. Students had the opportunity to piece together a variety of contextual information regarding

the work of art, and in the end they were very pleased with what they had learned.

The engagement with the museum can be quite varied. A professor in engineering who teaches lighting has students examine the effect of lighting on artwork; some architecture students come by often to look at the building itself. There are many different ways that the museum, the people at the museum, the institution of the museum, and even the physical structure of the museum can aid in teaching. The Spencer Museum of Art is very adaptable, and I like to make the argument that works of art are inherently interdisciplinary.

Object-centered teaching at the SMA can stimulate learning experiences that have “real impact,” as one professor has observed. The museum can provide a space for interdisciplinary scholarship and a platform for social connectedness, supporting KU to address complex social issues and advance deeper understanding across cultures and communities. Challenging assumptions, engaging ideas, and inspiring learning are among the successes that we hope faculty and students achieve. ♦

Hitching Ourselves to the Strategic Initiatives as Researchers *and* Teachers: A Sustainability Focus



Stacey Swearingen White
Urban Planning

When we try to pick out anything by itself, we find it hitched to everything else in the Universe.—John Muir, *My First Summer in the Sierra*

Although John Muir made this famous observation in reference to nature, academics of all types understand his sentiment well. Our teaching, research, and service activities frequently blur together and connect in ways that can be both challenging and intensely rewarding. To this end, it seems clear that KU's Strategic Initiative areas are best poised for success if they incorporate the full realm of our faculty endeavors. The issue of sustainability, which is a focal point of one Strategic Initiative area and an undercurrent in the others, provides a useful foundation for exploring these possibilities.

As it is most commonly defined, sustainability involves

satisfying current needs without jeopardizing future generations' access to the resources they will require. Many people equate sustainability with environmental concern, but this interpretation is incomplete. The KU Center for Sustainability notes: "Overall, sustainability is about building healthy, resilient communities where everyone has access to the resources needed to achieve a high quality of life without exceeding the capacity of our natural ecosystems."¹ Given this broader and more accurate understanding, which reflects economic and social aspects, it is not surprising that the concept of sustainability fits well into what many faculty members see as core elements of their work.

Reflective of this interest, sustainability in its broadest iteration was clearly embedded in the Strategic Initiative areas that emerged out of the proposals

¹University of Kansas Center for Sustainability: <http://www.sustainability.ku.edu/sustainability.shtml>

submitted to the Provost's Office last year. These areas will guide significant research investment and research activity at KU in coming years.

Research, however, should not be the full extent of the Strategic Initiative areas. To engage completely the imagination and talent of KU faculty and students, teaching must also play a key role in their implementation. Three possibilities for this more integrated approach with respect to sustainability include service learning, interdisciplinary courses, and a focus on KU as a living laboratory.

Service learning is an increasingly important element of many KU faculty members' teaching. By involving students in service projects that relate to their course material, faculty can engage those students deeply in that material and present them with the "real world" experiences they seek; such experiences may also involve a research component. Because communities and organizations are grappling with a variety of sustainability issues, sustainability-related service learning opportunities abound. For example, students in one of my Spring 2012 urban planning courses are assisting the KU Field Station with a plan to enhance its programs. Those students have gathered survey and interview data as part of their analysis, and they will present the Field Station with ideas through which it can connect with the Strategic Initiative

areas and the Campus Sustainability Plan. Students in my urban planning colleague Professor Bonnie Johnson's Site Planning class are working on a service learning project for the Mid America Regional Council's Creating Sustainable Places initiative. They are collaborating with design Professor Jeremy Shellhorn's classes to create 3-D graphic depictions of what sustainable cities could be like. These sorts of service learning

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projects may spark faculty ideas for new research related to or expanding on client relationships developed, or they may prompt students to take on research projects of their own.

Interdisciplinary courses are a second opportunity to enhance teaching and catalyze research activities. Courses that cut across disciplinary boundaries are not common at KU, but there is evidence this may be changing, particularly with respect to sustainability-related topics. The IGERT C-CHANGE program, for instance, has brought faculty from engineering and the social and natural sciences together to team-teach courses on climate change to graduate students.² These faculty members learn from one another through these courses,

and their classroom interactions have led to current and planned research collaborations.

Interdisciplinary courses, then, can benefit both students and faculty. Students gain insight into how different disciplines approach similar issues, and faculty develop ongoing relationships with colleagues who may become collaborators.

Finally, the KU campus itself presents an opportunity for faculty to align their teaching and

research activities with sustainability elements of the Strategic Initiative areas. From 2008 to 2010, a CTE faculty working group met several times to discuss ways to increase and improve KU curricular offerings related to sustainability.

Inspired by the notion of campus as a "living laboratory," we agreed that KU students could be highly engaged in learning activities that centered on campus issues such as transportation, energy, and waste. Many of the working group's ideas made their way into Building Sustainable Traditions, the KU Campus Sustainability Plan commissioned by Chancellor Gray-Little and released in Fall 2011. That semester, two KU classes in urban planning and applied behavioral sciences

²See: <http://web.ku.edu/~crgc/IGERT/>

included student research projects on campus sustainability issues, and they culminated in an end-of-semester open house where students shared posters about their research results with each other and the larger campus community. As in the previous examples, these sorts of activities can stimulate students and faculty alike to pursue additional, related research.

While I recognize that KU's Strategic Initiatives are research-oriented, I believe strongly that faculty research activity is kindled in a variety of ways, including through our teaching. Our work as faculty members, after all, is frequently "hitched" together, much as John Muir described. Sustainability is one topic through which faculty can engage themselves and their students in these initiatives. No doubt there are others. What remains is for faculty to jump in in whatever ways best suit their expertise and interests. ♦