

# Teaching Matters

Center for Teaching Excellence

September 2013 • Vol. 17 No. 1

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## How do we provide and evaluate deep learning for students?

*Professors at Research 1 institutions teach about half as many classes as those at more plebian colleges and universities in order to free up time for either funded or departmental research. Universities may compensate by running large lecture classes or hiring contingent faculty, but the disadvantages of those strategies for deep learning are pretty well established by now. —Margaret A. Miller, editor of Change magazine*

As Margaret Miller notes, Research 1 institutions like KU face particular challenges when it comes to teaching. This year, CTE is facilitating two programs designed to deepen learning for our undergraduate and graduate students.

The first program, which is focused on undergraduate education, has two components: postdoctoral teaching fellows and a faculty and student learning community, called the C21 Consortium. As Bob Goldstein explains (pages 4 and 5), the postdoc teaching fellows are partnering with faculty members to redesign gateway courses in STEM disciplines. CTE leaders are working with KU administrators to expand the program next into the social sciences and then into the humanities. The College plans to

send a call for proposals for social science teaching postdocs to chairs late this semester.

The second program benefits both undergraduate and graduate student learning. It kicks off with nationally recognized consultant Barbara Walvoord on campus October 3 and 4 for workshops for department representatives. The workshops will help faculty members develop program assessment plans for our HLC accreditation self-study. These plans will keep faculty members informed of the success of their undergraduate and graduate degree programs and allow faculty to make informed, time-efficient curricular decisions. CTE will offer follow-up sessions on assessment throughout the 2013–14 academic year.

CTE, along with the Provost's Office, the Office of Institutional Research and Planning, and the HLC Accreditation Steering Committee, are co-sponsoring Walvoord's workshops. For more information, contact CTE's Documenting Learning Specialist Ying Xiong at [yxiong@ku.edu](mailto:yxiong@ku.edu).

—J. Eddy

Miller, M.A. (2013, July/August). Wide is the gate. *Change*, p. 4–5.

## Methods du jour or enduring change?

Dan Bernstein, CTE

Academic leaders at KU currently deliver a consistent message that courses need to engage students and guide them to greater levels of success, and new resources are available to support faculty work toward those goals. Reflecting on this climate, I was reminded of a conversation I had with a dear friend and colleague about 15 years ago. As happens often, the topic shifted into teaching, and she became slightly agitated. "You just want everybody to teach the way you do, using the methods du jour," she said. "I lecture and they learn. There's no problem in that." While grateful that our friendship could support such a declaration, I did feel the need to reply to her assertion that I was somehow the education fashion police, enforcing whatever faddish forms of teaching were making the rounds.

I replied that I was not promoting a particular form of teaching, and I reminded her that I had worked hard to block the implementation of a "teaching behavior checklist" that a colleague in another department tried to get into faculty senate bylaws. It was a clumsy collection of in-class performance items that have low but beyond-chance correlations with expert ratings of teaching competence. "If you have evidence that students are learning well," I countered, "I give no privilege to one method over another. Just show me the evidence of learning."

We never did arrive at an empirical resolution of our difference (and we remained friends), but in the intervening years many others have taken up that comparison of teaching methods. First in the educational research and composition studies literatures and now more recently in the world of

learning within disciplines, comparisons of results from listening to lectures with results from active learning show a consistent increase in amount, depth, transfer, and retention of understanding when students are active participants in the educational process. Many other variables also influence the results, and it turns out lectures can be a good way to address complex topics with an audience of very advanced learners. But for first exposure of beginners to

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knowledge and flexible understanding, it is more effective to engage learners through the many forms of interactive education. Lectures can produce learning,

but by many indications there is more and deeper learning from other ways of teaching.

And so that brings us to AY 2013-2014 at the University of Kansas, where we are witnessing an unparalleled effort to shift instruction away from conventional lecturing as the modal form of face-to-face teaching. Some oral presentations are compressed and recorded for access outside class time, leaving in-class interactions to engage students, promote flexible understanding, and practice the most challenging skills and problem solving. Some faculty members are using online programs that guide students in reading and provide individual feedback based on answers given to checks on understanding. Others are using non-technical methods to assure preparation using printed texts and workbooks, thus liberating class time for engaging learning. Many teaching spaces are being created or renovated in formats that promote individual and team learning, based on the presumption that information

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## Peer Teaching Triads forming now

The 2013-14 Peer Teaching Triad Program will kick off with a meeting after Fall Break, to bring groups together, share syllabi, and discuss goals. Based on feedback from previous participants, we're forming triads in the fall semester and suggesting members do observations in the spring, to allow more time for interactions and reflection among group members. But members can choose to meet only in the fall, if they wish.

CTE's Peer Triad Program is a way for faculty and instructional staff members to engage in discussion about a course with two other colleagues. These colleagues can come from your own department, or they can be from other departments across campus. You and your peers will discuss learning goals, observe each other's classes, and review samples of student work. At the end of the

year, your group can summarize reflections about what you've learned from the interactions. These reflections document your growth as a teacher. You can use this material for annual reports and/or promotion and tenure files, or simply keep the material for yourself. Most groups work together about five to ten hours a semester.

If you are interested in being part of a peer triad, by October 4 contact Susan Williams at [smwilliams@ku.edu](mailto:smwilliams@ku.edu). Briefly describe your course information (class size, format, etc.) and your teaching goals or what you would like to discuss with your peers. If you have other colleagues you want to be in your triad, let Susan know their names so she can group you together.

For more about peer triads, contact Susan Williams or contact Judy Eddy at [jeddy@ku.edu](mailto:jeddy@ku.edu).

## Methods du jour or enduring change?

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transfer and practice of foundational skills will be done before class time. And as other articles in this issue of *Teaching Matters* describe, there is a new program for postdoctoral fellows to support transforming large classes and also a faculty and student consortium to learn from our early efforts and promote further expansion of the work.

This level of activity is driven largely by the commitment of our campus to student success, measured in retention of students and completion of programs and degrees. Research supporting these changes has been around for a while, but evidence alone was not sufficient to bring on large-scale adoption of new methods. There certainly are no education-fashion police at KU, as most of the ceremonies and rituals around good teaching continue to honor great traditional classroom performances. It appears that our commu-

nity—including the Board of Regents, legislators, and parents of prospective students—has asked why our costs go up but our students' success has not kept pace. In that climate we can no longer shrug when students fail to complete challenging courses taught in conventional ways; we need to ask whether anyone in our profession has found a way to help more students stay engaged in learning and master the skills we feel define high quality education. With so many changes in the KU landscape and the demands on us all for more and better work across the full range of our missions, this may seem like a difficult time for a dramatic move to upgrade teaching on a broad scale. Perhaps we need to remember that the reasons are very good ones, there is solid academic research to support the decisions, and in the end the real beneficiaries are our students and our community.

### KU's Teaching Postdoc Program: Partnering with faculty members to transform gateway courses

Bob Goldstein, CLAS/Geology  
with Ann Martinez, CTE/English

We often find students who come to college interested in a particular STEM discipline, but they do not continue in that field because they lose interest. Part of it is because of the way we teach. The standard method for teaching many STEM courses is the “sage on the stage”: a lecture is directed at a gigantic group of students, and it is very difficult to promote engagement. Scientists, much less students, don't usually get excited about a lecture. People get excited about doing, about solving problems, and having someone lecture to you puts you in a passive position and doesn't really engage you.

If students are immersed in course material, they learn a lot more. KU teachers want to improve student learning; we want to encourage students to continue in STEM disciplines

and to be successful in these. Engagement is a key aspect for the intellectual work that needs to be done to learn, so ultimately we want to transform courses to promote student engagement.

The Teaching Postdoc Program at KU is designed to transform the way we teach large gateway courses in natural sciences, mathematics, and social and behavioral sciences, by implementing a new module that promotes deep engagement in a class. The postdoc fellows are agents of change who come into departments as partners with the faculty and help redesign gateway courses that enroll hundreds of students. Currently, KU has three such postdocs: one in geology, one in geography, and one in the biological sciences working

with biologists from undergraduate biology, molecular biosciences, and ecology and evolutionary biology (page 7). During their three-year term, each postdoc fellow will help transform four to five different courses by teaming up with the faculty and envisioning new exercises, different modules, and different methods of delivery.

One such transformative method is “flipping” a course. Rather than listening to a lecture in class, students access this material at home, complete the readings, and do exercises where they have to

do problem sets to be ready for class; once in class, they get involved in group and team projects under supervision. Students have to complete a lot of work outside of class, but class time is then spent deepening that learning, deepening that understanding. By doing,

rather than by just listening, students in class are engaged at a higher level of skill that promotes retention of the material—it's all about getting students to think.

For faculty members who were educated in a certain way and who have been teaching in a certain way, change can be very difficult. The idea of using lecture time for group projects and developing exercises where students learn material outside of class is a huge transformation. But the postdoc fellows are there to aid in the transition. They work with multiple faculty members at one time who teach the same course, promoting teamwork and making it possible to share resources in a very effective way to show consistent teaching

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and consistent learning from semester to semester. With this method, faculty don't have to start from the beginning every time they make a change in their lesson plan—it is much more time efficient, which is important since time is a very limited resource for faculty members. When the program is finished, the postdoc fellows leave behind a transformed curriculum and a transformed faculty member who is comfortable teaching courses under a new module.

The origin for implementing the Teaching Postdoc Program at KU came from our interactions with David Budd from the University of Colorado at Boulder. At the time, Carl Weiman, recipient of the Nobel Laureate in Physics, had started a teaching postdoc program on CU's campus focused on the scientific approach to student learning. The favorable impact it had on classes at the University of Colorado led to KU's involvement. Weiman then joined the University of British Columbia, which is part of the Bay View Alliance. The BVA, a consortium of research universities that includes KU, states as its mission to "accelerate the rate of adaption, exploration, and effective integration of methods of instruction that support improved student learning." Rather than focusing on teaching methods, its "emphasis is on issues related to leadership, motivation, organizational culture, and change management that lead to, support, and sustain improved teaching and learning." The BVA group at KU has been committed to the Teaching Postdoc Program, assisting with the application and selection process.

The Teaching Postdoc Program is the result of team collaboration in its own right. From the beginning, just over one year ago when the proposal was first written, support from throughout KU has been fast and incredibly nimble. Implementation of the program at KU has had the full backing of Danny Anderson, who assisted with procuring funding through the College of Liberal Arts and Sciences and the Provost's Office. The

Center for Teaching Excellence provides resources and support for postdoc fellows. Dan Bernstein has helped formulate ideas for implementation, and through her association with CTE, Andrea Greenhoot has started the C21 Learning Community (see page 6), which is linked to this program. Steve Case and his colleagues at the Center for STEM Learning bring expertise into this educational component by mentoring the faculty members and postdocs and evaluating the program data. The Center for Online and Distance Learning (CODL) is a very important project partner as well, offering content and developing the technology that participants need. But one of the most important elements that make all of this work well is the faculty's engagement and their excitement about doing something so transformational.

The College will send a call for proposals to departments this fall semester, and there are plans to expand the program in the future, potentially beyond the STEM disciplines, making a real difference for a large number of KU faculty and students. We plan to keep the faculty informed about the program's progress; watch for updates from CTE.

*For more about the Bay View Alliance, see [www.bayviewalliance.org](http://www.bayviewalliance.org)*

### C21 establishes student-centered teaching community

Andrea Greenhoot, Psychology/CTE

Most faculty members participate in intellectual communities organized around our scholarship or creative work. In these communities we exchange ideas, challenge each other to think in new ways, and ultimately advance the work in our fields. For most of us, similar opportunities for intellectual discourse on teaching are rare. One opportunity CTE is providing this year is a new intellectual community around student-centered teaching. The C21 (i.e., 21st century) Course Redesign Consortium is a group of individuals from across campus who share the goal of student-centered course transformation at KU. These course transformations take advantage of today's widespread availability of information, and they move students from a passive role in a classroom (e.g., note taking) to an active learning orientation (e.g., problem solving, writing, and collaboration). Many consortium participants are tackling the design of large enrollment courses by using 21st century technology to create learning experiences that are collaborative, hands-on, engaging, and facilitative of deep learning. C21 will connect instructors involved in this type of course design with each other, with students, and with multiple resources that will facilitate their work.

The hub of the consortium is the new CLAS Teaching Postdoc Program for the natural sciences, mathematics, and social and behavioral sciences. C21 includes the teaching postdocs and the department faculty members with whom they are collaborating, faculty leaders in hybrid or student-centered course design, instructors implementing redesigned courses, and specialists from CTE, CODL, and the Center for STEM Learning. The consortium also includes graduate assistants to support consortium members' work on their courses, plus a pool of undergraduate peer men-

tors who can share student perspectives on the transformed courses. Although we are organizing C21 around the Teaching Postdoc Program, the major motivation for the consortium is to broaden the intellectual community beyond the few departments that currently have teaching postdocs. Many faculty members report that some of their most exciting and fruitful teaching innovations are generated by conversations with teachers from very different fields. Thus, we will connect department teams working in the postdoc program with people from a wide range of disciplines, to capitalize on the different perspectives and experiences that individuals from different disciplinary areas bring to the table.

C21 activities are being jointly organized by CTE, CODL, and the Center for STEM Learning, hosted by the Commons, and funded by the Provost's Office and CLAS. Most meetings will take the form of team course design workshops that create opportunities for members to collaborate on course redesign and utilize resources that can simplify, support, or document their work.

The goal of C21 is to build momentum toward widespread adoption of 21st century, student-centered teaching methods. Most of us learned to teach in a culture that emphasized the role of the instructor as a deliverer of information and the student as the receiver. Therefore, a model that reverses those roles is novel for many of us, and it often requires knowledge and skills that go beyond what we can expect a busy, lone faculty member to have. Participants in C21 will not have to discover or generate all of the good ideas by themselves. We hope that C21 will stimulate, support, and advance high-impact teaching, and in doing so help contribute to a new educational culture at KU.

## Meet KU's new teaching postdocs

Kelsey Bitting, Department of Geology

Kelsey Bitting earned her PhD from the Department of Earth and Planetary Sciences at Rutgers University. During her tenure there, she worked on various active learning endeavors, ranging from earth science institutes for elementary and middle school teachers and field trips for the Rutgers Geology Museum to guiding graduate students through the process of writing national grant proposals. Teaching “Planet Earth,” a large introductory geology course for non-majors, gave her experience reforming undergraduate science courses to include methods such as think-pair-share, five-minute papers, and peer-reviewed writing assignments.



Alan Halfen, Department of Geography



Alan Halfen is originally from Sauk Prairie, Wisconsin, a small town northwest of Madison. He earned a BS in geography from the University of Wisconsin–Platteville, an MS in geography from the University of Wisconsin–Milwaukee, and a PhD in geography from the University of Kansas. His principle research focuses on aeolian landforms, their response to changes in climate, and the palaeoclimate records contained within their stratigraphy. Beyond this research, he is also active in geovisualization and geoscience education research. His principle role as a post-doctoral fellow is to assist the Department of Geography in redeveloping GEOG 104: Principles of Physical Geography, a survey level course that fulfills the natural science requirement for Goal 3 of the KU Core Curriculum.

Anna Hiatt, Undergraduate Biology

Anna Hiatt earned a BS in biology from Presbyterian College in Clinton, South Carolina, and a PhD in zoology at Oklahoma State University. During her graduate career she gained extensive experience in developing assessment tools, specifically concept inventories, with both introductory biology students and biology majors to gauge conceptions about evolutionary biology. In KU undergraduate biology courses, she hopes to use her experience working in large-enrollment, inquiry-based, introductory biology courses to develop and empirically evaluate changes initiated in KU classrooms and to contribute nationally to the pool of effective college science teaching methods. About this work, Anna writes, “It’s time for flipping, and clicking, and tweeting, OH MY!”



## END NOTE

### The three most time-efficient teaching practices

With increasing pressures on faculty and instructional staff members, these three teaching practices may help you make the most of your time for teaching. They are from Linda C. Hodges, University of Maryland, Baltimore County, and they were first published in *The National Teaching and Learning Forum*.

#### **Begin with the end in mind**

Wiggins and McTighe (1998) articulated the concept of backward course design, which begins by determining what it is that we want students to be able to do or think after the final exam is over. Then connect every part of the course to those goals and determine how students will demonstrate the kind of learning we want of them (assessment). Finally, develop the class format and activities that would facilitate that achievement. Aligning goals, assessments, and activities builds in a coherence and synergy in the course that creates greater opportunities for students to learn what we want them to learn.

Backward design helps focus our efforts and saves class preparation time in at least three ways. First, we spend less time deciding what readings and assignments to include because we now have targeted criteria to use—our course goals. Second, we design assignments around course goals, so we spend less time grading or responding to assignments that don't accomplish what we had hoped. Third, we are more apt to restrain from taking on too much in the course. Articulating goals rather than masking them in a generalized descriptive statement (e.g., "In this course we will discuss the effect of global economics on world trade") helps us see more clearly the demands we are placing on novice learners.

#### **Generate criteria to describe work for students**

Sharing with students the criteria we will use to evaluate their work models disciplinary thinking and helps them develop the ability to evaluate their own work. Using criteria or rubrics to grade student work saves time by helping students produce better quality work (and better quality work is both faster and more pleasurable to grade); allowing us to assign points more quickly and consistently as we grade; and providing clear criteria for us to use in talking to students about their grades. Although it takes time to generate criteria sets, we can use them many times and adapt them to multiple purposes.

#### **Embed "assessment" into assessments**

Just as we look for evidence to make arguments for theses or hypotheses in our disciplines, when we assess student learning outcomes we determine if our courses are accomplishing what we planned. Based on what we learn, we can change our courses to make them more efficient in producing the outcomes we want. The information gained from monitoring students' performance makes our teaching more time-efficient by directing our choices on class activities and assignments. For example, we can focus class activities on areas students find most challenging. Likewise, we spend our preparation time designing and responding to assignments that are targeted more directly at developing key skills in students. The time we spend is more likely to produce the kind of learning we want in students.

Hodges, L. C. (2012, Sept). The three most time-efficient teaching practices. *The National Teaching and Learning Forum*, p. 1–3.

*Teaching Matters* is published by the Center for Teaching Excellence. We welcome your comments and suggestions. Editor: Judy Eddy

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