Teaching Matters

In This Issue

KU CENTER FOR TEACHING EXCELLENCE
The University of Kansas

Breeding ground for a hybrid course

Michael S. Vitevitch, Psychology

In Fall 2011, the Association of Public and Land-grant Universities (APLU), the American Association of Community Colleges (AACC), and the Open Learning Initiative (OLI) of Carnegie Mellon University partnered together and solicited proposals from colleges and universities across the country to redesign introductory courses in several fields. The redesigns would take advantage of developments in information technology and learning science to create "hybrid" courses. These courses are creating a seismic shift in the educational landscape of large, introductory courses that will affect students and faculty in a number of ways. After a site visit in January from members of the APLU, AACC, and OLI, KU received confirmation that we would serve as a Lead Institution to develop a hybrid version of introductory psychology.

What is a hybrid course?

Hybrid courses are not webpages with podcasts of lectures, or Blackboard sites with all of the readings for a class in PDF. Instead, a hybrid course (a.k.a. blended learning) combines face-to-face interaction in the classroom with web-assisted learning tools. If that definition sounds rather abstract, and full of… jargon, then—if you do research with humans or animals on campus—consider the tutorials on the ethical treatment of research participants developed by the KU Center for Research, and the day-to-day activities in your lab. The online tutorial provides faculty, staff and student researchers with foundational knowledge about research ethics and behavior, including basic definitions and important cases that shaped current policy. To complement that factual knowledge, a researcher takes part in face-to-face (or face-to-snout) activities, which allow the researcher to apply basic material they acquired via the online tutorials, resulting in a more complete understanding of ethical research behavior.

Turning now to the classroom, a hybrid course enables an instructor to put basic information into an online tutorial that uses mastery-based learning to ensure that students have acquired that foundational knowledge. With such online testing methods, an instructor can look at test results (i.e., data) to see what percentage of students "got" which topics, and which topics need clarification. This enables

A time for telling

Dan Bernstein, CTE

For various reasons, the classic lecture has become the whipping boy of modern American education. Famous professors, educational researchers, and now many journalists create a chorus telling us that today's students cannot learn by listening to a professor talk. It seems a strange claim to many of us, for we can recall important ideas that we encountered listening to a professor in college, and we also successfully give and attend colloquia and conference presentations. And there is something compelling about a good narrative, an unfolding of related ideas and events that combine into both profound and memorable ways of thinking. Some basic research helps us understand these apparently contradictory impressions.

Much of the conversation about lecture focuses on its entertainment value, either noting that endless PowerPoint is a cure for insomnia or claiming that a professor's performance is inspiring and motivating. Both of those views, however, miss the most educationally relevant question: what do listeners learn and remember as a result of hearing and/or watching a presentation? Whether dull or stimulating, we need to evaluate this time-honored tradition by its effectiveness in helping students understand course topics. If we ask students to spend 35 hours over a semester listening to us talk, we should be able to assure them that their time is a good investment in learning.

At our last Summit, Marcia Lovett of Carnegie Mellon University presented evidence typical of research on this question. In a beginning statistics course, students learned more and remembered it longer when content was covered in an online tutorial, and face to face time with the professor was focused on problem solving and responding to topics that students struggled with online. This alternative to presenting new content via lecture was still more effective when it was accelerated and students spent half as much time as they did in the conventional lecture course. It is important to note that the professor did talk to the class; the content of the talk was not delivery of ideas, however, it was responding to nuances and challenges revealed by students' work in the online tutorial.

A set of fine laboratory studies puts these results in a larger context. Cognitive scientists used lecture as a means of teaching conceptual material to research participants; some participants had previously analyzed the material covered, while others had only read the material or summarized it. The lecture added significantly to the learning of students who previously engaged in analysis, but the lecture did not add to the learning of students who only read or summarized the material. Lecturing is a useful tool for those who already have developed some understanding of a topic, but it has less value when the audience has only surface familiarity with the content.

So we are correct in our experience of learning from lectures, in part because we typically have analyzed similar material before and we are prepared to benefit from another scholar's analysis. And the research on lecturing is also correct in part, because the students involved are typically beginners whose first exposure to material was in a lecture. As reported in this issue, a number of KU faculty members are seeking ways to use online experiences to prepare students to benefit from face to face class time, both problem solving and presentation. As we move away from lecture as the primary method for first exposure to content, we can remember that there is a time for telling our students what we understand. We just need to prepare them more deeply so they can benefit from hearing our analysis.

Breeding ground for a hybrid course

the instructor to focus class time on specific topics instead of drudging through everything, sometimes rushing through the most difficult concept because the steam whistle is just about to blow.

Using data from the online tutorials and tests also enables the instructor to use the face-to-face time in the classroom to engage in small-group activities, brief writing assignments, and discussions of video clips or case studies that add intellectual depth to definitions that would otherwise have been rote memorized by students the day before an exam. Complementing the online material with the face-to-face experience leads to a deeper understanding of the material.

Reaping the benefits of hybrid courses

The support provided by the APLU, AACC, and OLI to KU will result in a hybrid version of general psychology, an introductory course that typically has large enrollments each semester. We expect to yield a number of benefits from this effort within the psychology department and across the University, as well.

For the Department of Psychology, we anticipate the hybrid course will bring a level of uniformity to the curriculum. Currently, several faculty members from different areas of psychology—including clinical, social, and cognitive—teach the larger sections of Introductory Psychology, each infusing the course with her or his own flavor. In addition, upper-level graduate students from different areas of psychology teach smaller sections of the course, further increasing the diversity in the "Introductory experience." The hybrid course will ensure that each student who takes Introductory Psychology at KU will leave the class with the same basic competencies and skills (as assessed by the online testing components). While some might view the hybrid course format as a constraint on the creativity of the instructor, I dis-

agree; the hybrid format actually affords more opportunities to infuse the class with creative and unique activities (in the face-to-face classroom time) that not only enhance the introductory experience, but also enable the instructor to add his or her own perspectives on the field.

The uniformity of the introductory experience does not apply just to KU. We have partnered in this effort with Johnson County Community College (JCCC) to develop and offer this course in the future, ensuring that students transferring from JCCC can jump into the upper-level psychology classes with the competencies and skills that instructors of those higher-level courses expect students who have had the pre-requisite class to possess. This will allow students to transfer to KU without having to re-take a prerequisite class that they already took, resulting in delays in their progress to degree and additional financial stress. The APLU, AACC, and OLI anticipate similar benefits occurring nationwide as more institutions adopt the hybrid course we develop here at KU.

In addition to KU giving this course to others, we at KU will be getting information from OLI regarding technical and design issues in the development of hybrid courses. We anticipate that this information will be invaluable to other KU departments as they "hybridize" their own courses.

Perhaps the most important benefit of hybrid classes is that they place the responsibility of a student's education squarely where it belongs: in the hands of the student. The instructor is no longer the medium that teaches students everything they need to know about a particular topic. Instead, hybrid courses make students responsible for their own education, allowing them to learn how to learn, to learn at their own pace, and to learn how to learn through out their lives. These are lofty goals to be sure, but one never achieves success by aiming low.

PERSPECTIVES

Costs of college

Angela Lumpkin, Health, Sport & Exercise Sciences

A changing landscape of higher education in the United States is inevitable. While higher education is steeped in tradition and often resistant to change, skyrocketing costs will mandate operating differently. In addition to cost escalations, higher education is bombarded by increased competition from for-profit institutions, technological advances that preclude doing "business as usual," and demands for accountability and especially for student retention and degree completion.

According to the College Board, over the past 20 years, tuition and fees have surged almost 130% (Surging College Costs, 2011). In 2011-2012, the College Board (What It Costs, 2011) reports that the average cost for tuition and fees at a public, four-year college is $8,244 for in-state and $12,526 for out-of-state students. Students attending private, non-profit, four-year colleges average paying $28,500 in tuition and fees. Average tuition and fees at public, two-year colleges are $2,963 annually. Most students do not pay these prices, however, since a full-time undergraduate student receives an average of $12,455 in financial aid. Despite scholarships and average of $6,500 in grants, college graduates who finance their education face an average debt of $24,000 (Vedder & Denhart, 2011).

Part of the problem is that colleges have few incentives to cut or control costs. Rather, most colleges willingly spend more money, often on non-educational or mission-related activities, to improve their rankings. Instead of addressing the needs of their real customers, students and their parents, colleges often resist measuring the "value-added" of the education their students obtain (Vedder & Denhart, 2011).

Lessons can be learned from for-profit institutions that focus on meeting students' needs, such as through convenience of course offerings, use of various learning opportunities and experiences leading to degrees and other work-related credentials, and efficiencies in operations. One policy group, the Center for College Affordability and Productivity (2010), recommends specific ways to reduce the cost of college. For example, lower cost alternatives could include promoting dual enrollment programs, offering three-year bachelor's degrees, and outsourcing services and operations. Colleges could reduce layers of administrative staff and eliminate under-subscribed academic programs at institutional and state levels. Greater efficiencies could occur through improved utilization of facilities, increased teaching loads, and students' timely graduation. Technologies could increase the number of online courses and reduce the cost of textbooks through e-books. However, reducing the cost of college by improving the quality of its graduates will require embracing change. Are institutions willing to do this?

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Reflections on developing a hybrid course

Susan Williams, Chemical & Petroleum Engineering

As I described in *Teaching Matters* last semester, historically about 25% of the students in my sophomore-level Material and Energy Balances course struggle. A significant number of these students are very capable, but they develop skills more slowly than the top students and have difficulty keeping up. During the course lecture and discussion sessions, they need more time than I can allow in order to solve problems. Due to the number of students in the class, graders and TAs need at least a week to provide feedback (limited to checks and marks for correct and incorrect responses), which exacerbates the situation.

In response to these challenges, I redesigned my course, taking it from a traditional lecture to a hybrid course. The online content was in the form of "modules" that ranged in length from five to 20 minutes. Each module started with a statement of the objectives for that module and included examples of problems solved in real time. Students were responsible for watching these modules **before** coming to class, so that we could work on problem solving in groups during class time. I did not lecture, but guided students through each problem solving process. I also changed the homework to be online and mastery based so that students could try the assignment as many times as they wanted until they answered the questions correctly. The enrollment in the course was approximately 90 students, similar to the enrollment in the previous two years.

Overall the experiment was extremely successful. Below are some of the main observations from the experience, all of which I feel had a direct impact on student learning.

1. Students received feedback on homework and their ability to solve problems much more quickly than I was able to provide in previous semesters. This resulted in students being able to "stay with the material" much better.

2. Every student who completed an end-of-the-year evaluation of the course gave the highest rating possible for the question "The objectives of the course and the method to achieve them were clearly stated." Of the 13 questions on our department student survey of teaching, students gave the highest rating possible on nine questions.

3. In previous years I have struggled to get through all of the material that I had planned for the year. This resulted in rushing through some content or removing content from the course. This year, after covering all of the material that was planned, I had four class periods left that I used to cover integrated topics. So I was able to cover everything I wanted, plus add some material to the course.

4. The average score on the cumulative final exam (the exam is the same every year to allow for comparison between years) was almost 10% higher this year than in 2011.

Our department has identified successful completion of this course as key to students' success in our program. The time and effort that it took to redesign and implement the changes were well worth it. It was very challenging to do in one semester, and I literally stayed one class ahead of the students in creating the modules, but I will certainly do this for similar courses in the future.

In the 12 years that I've taught at KU, this experience had the greatest impact on me as a teacher. I had more fun teaching this class than any other. I expected more from students, students did more, and they learned more. Every day meant something. And I know students' deeper learning will mean something to them.

The success of problem-based learning in the undergraduate School of Medicine curriculum

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Garold Minns, SOM–Wichita

Problem-based learning (PBL) is a form of small group learning which uses problems as the stimulus and focus for student activity. Its origins can be traced back more than 50 years to the medical faculty of McMaster University, and it has spread from institutions of higher education to K-12. The School of Medicine introduced PBL into its undergraduate curriculum in the late 1990's and expanded its use in 2006 with a centralized, integrated preclinical curriculum focusing on active and self-directed learning. PBL is a part of almost every module as a continuum of cases throughout the first two years of medical school.

PBL groups consist of a small number of students (8-10) and a clinical faculty facilitator or "tutor." The groups are presented with a patient case and meet at least twice to work through information presented in the case. During the first session, students extract relevant cues, identify problems, hypothesize possible causes to explain the problems, collect and analyze data, and identify learning issues. Learning issues are the information necessary to clarify and explain the causes for the problems that have been identified. Researching these learning issues takes place between the first and second session. Students may consult textbooks, journals, web resources and faculty to prepare for the second session. During that session, students apply newly acquired information to the case as it continues to unfold.

Of all of the teaching modalities in the pre-clinical curriculum, PBL receives the highest student ratings. Students appreciate how it presents real-life problems (patients) and makes clinically relevant the information that they are learning in didactic portions of their modules. Faculty embrace it as a teaching format because it provides students the opportunity to develop critical thinking and problem-solving skills. Providing this type of small group learning does bring with it the need for more resources, including more faculty and more rooms to accommodate groups.

Student assessment in PBL takes place via points for attendance, preparation and participation. Enhancements that are planned for PBL in the future include incorporating narrative evaluations of each student by the tutor, more weighting of the activity as part of the final score in the module, and creating a consistent thread of concepts and connections between all of the PBL cases.

More interaction, less preparation with team-based learning

Marty Eng, Pharmacy Practice

I began using a team-based learning (TBL) strategy about four years ago. TBL changes the way student time in and out of class is used. Prior to class, students are expected to obtain the more straightforward content. The key is providing clear objectives and materials. I include a short (15-20 minute) video clip to guide students through readings. Students are held accountable for readings in that the content is not covered in class. Rather, I use the clicker system to assess their learning. This also enables me to give feedback to students during class.

Students develop application skills in teams the second half of class. After class, they practice applications. Between exams, team activities are scheduled. These are graded sessions whereby an individual takes a quiz then retakes the same quiz in teams. Teams teach each other in this format. Next, they tackle a significant problem which asks them to make a specific selection. Then, I orchestrate a simultaneous report. Teams proceed to debate one another based on their responses. Finally, students complete a peer evaluation form.

Since implementing TBL, I have interacted more with students and prepared less each subsequent year. I no longer feel the need to "cover" everything. I notice as I interact with students that their questions are deeper and their interactions with one another are richer. I conducted a survey, and students were very positive overall and felt they developed a clinical thought process. Students also felt that the course environment was conducive to learning and helped them apply new knowledge. The hardest task for the student was the ambiguity in team application exercises.

I have used this strategy in a class of 106 and currently 148. References from www.teambasedlearning.org cite use in classes up to 400. I am currently exploring ways that technology might help me in grading peer evaluations more easily.

More than a talking head

Paul Atchley, Psychology

I have taught using only traditional lectures, lectures blended with active learning and hybrid approaches, and a completely online, student-paced environment. I have also examined student performance on a capstone course that spanned a traditional class, a small class, and an online version of my research methods course.

While all of these methods can lead to student learning, I think my favorite is the hybrid model. Lectures on complex topics are sometimes necessary to provide students with a firm conceptual foundation they cannot achieve on their own. The hybrid approach has the advantage of permitting lectures when applicable, but also moving the instructor away from becoming a talking version of the textbook. The hybrid model can make lectures better by ensuring students are ready to go deeper into concepts. By moving the most basic level of learning (remembering and understanding) to student time, students are prepared to use class time to analyze, apply and discuss. I have noticed more sophisticated questions from students and fewer simple questions. Most telling is that I am able to skip past slides without students asking me to pause while they copy the words, because they already know the concepts.

In its most complex form, a hybrid class moves more learning to out-of-class time, allowing for more sophisticated use of class time. In my honors methods course, I have students take a completely online version of the class I teach in the summer (with the same peer-graded exercises, quizzes, and tests) in the first seven weeks of the semester. During those seven weeks we can talk in greater depth about the concepts. In the second half of the semester we have time for group projects, iterative, peer-graded writing exercises and presentations. This version of a hybrid course is truly exciting in terms of student achievement, but it is also quite a bit of work to develop. In this case, the transformation was years in the making, requiring development of peer-graded active learning exercises and rubrics, online quizzes and tests, lecture materials, examples and videos. But if one starts with simple changes, and adds to them over time, anyone can build a hybrid class.

END NOTE

Four ways to support change in higher education

In a recent article in *Change*, John Tagg analyzes the structure of faculty members' work and considers ways higher education might more effectively support change. Tagg identifies "endowment" as a key concept that either facilitates or impedes change. He describes the endowment effect thus: My "things" (ideas as well as objects) gain value just by virtue of being mine. In the context of faculty life, one of the most treasured endowments is tenure, which is often strongly linked to research and preserved by the solidarity faculty members find within their departments.

For institutions that want to design change, Tagg offers four suggestions:

1. Create pro-change endowments. Link hiring, promotion, and tenure to more than narrow disciplinary research. Develop an endowment that values teaching and learning and supports faculty commitment to change.
2. Link faculty endowments to collaborative work instead of only to individual work. If all the significant rewards are accessible only to faculty acting as individuals in private, then collaborative work with other faculty will seem a loss rather than a gain.
3. Create structures through which large numbers of faculty can design change. For example, when a task force works together on a plan, that plan becomes their endowment ("our" problem, "our" interpretation, "our" plan). Others can become part of a change when they are engaged in defining and shaping that endowment.
4. Establish channels outside of academic departments through which faculty members can build their endowments. Departments as presently configured reinforce the priority of specialized research and faculty privacy and autonomy. If other avenues for faculty development and endowment are created, departments may become more flexible.

Tagg concludes: "The key to designing and executing productive institutional change is not simply to build a better academic mousetrap. Faculty will not beat a path to the doors of those with the best arguments. We need to not only design change for our institutions but redesign our institutions for change. At base, we must recognize that we can't change without changing. We cannot create a better future unless we are willing to embrace a future that is different from the past" (p. 15).

Tagg, J. (2012, January/February). Why does the faculty resist change? *Change*, 44 (1), 6–15.