

Teaching Matters

News & Information from CTE

Fall 2017

Vol 21, No 1

Discover ways to use authentic learning

At the start of the fall semester, our Teaching Summit keynote speaker, Randy Bass, described ways that authentic learning benefits students. Authentic learning is a style of learning that encourages students to create tangible, useful products to be shared with their world—real-life tasks, or simulated tasks that provide the learner with opportunities to connect directly with the real (rather than just the academic) world.

In this issue of *Teaching Matters*, we follow up on and expand considerations of authentic learning and showcase examples of how it is being used successfully at KU.

Andrea Greenhoot describes how she uses an authentic assignment in her Memory and Eyewitness Testimony course. Rather than create a simple group report with PowerPoint slides, her students create a simulated news video.

Doug Ward discusses the process his students have used to develop a digital survival guide for freshmen, an e-book on KU



Colin Roust works with students on an authentic learning assignment. See page 5 for more about it.

traditions, and an interactive guide for finding study spaces.

Sarah Crawford-Parker from First-Year Experience highlights two courses that provide new students with opportunities to apply learning beyond the classroom.

At the heart of the issue, though, are examples of authentic assignments from your KU peers. Whatever your discipline, you are sure to find inspiration for a new approach to your teaching.

—Judy Eddy

In this issue

CTE View—Andrea Greenhoot describes authentic learning and how to start implementing it in your course, pp. 2-3.

Snapshots—Examples of authentic assignments at KU, pp. 3-4 and p. 8.

Innovations—Doug Ward considers authentic learning and student choice, p. 6. Sarah Crawford-Parker discusses ways that first-year seminars provide opportunities for new students to make authentic connections, p. 7.

Fostering learning and engagement with authentic and inductive learning tasks

Andrea Greenhoot
CTE/Psychology

How can we help our students be prepared for an uncertain future? The 2017 Teaching Summit speaker Randy Bass, Georgetown University, offered this vision: integrative learning experiences that foster development of students' intellectual, affective, imaginative and reflective capacities are needed to prepare them for challenges they will face in their professional, personal and civic lives.

Faculty can help students access high-impact, integrative learning experiences by bringing such experiences into the classroom through authentic and inductive learning tasks. These learning tasks place students in real or realistic situations where they use knowledge and skills learned in their course to solve messy problems or to help someone who is not the instructor. Thus, rather than complete essays, papers and examinations that are

framed in an academic context and directed only at the instructor, students can write a real or simulated op-ed or news piece, generate or edit a Wikipedia entry, design a product or ad campaign for a real (or imagined) panel of experts or consumers, or put on a research poster session.

Findings from the learning sciences tell us that giving students authentic reasons for their work in a course can increase motivation, deepen learning of critical concepts and skills, and extend the value of their courses to non-academic contexts. Furthermore, using questions, cases or problems to provide a context for learning material helps students see from the beginning of the learning sequence what the facts are for, thus improving the organization of their new knowledge and increasing the likelihood that material sticks with them. Introducing new

material as a way of addressing burning questions and pressing problems, rather than a collection of facts for use at a later time, also leads to increased engagement and deeper and more transferable understanding.

An informal experiment in my Memory and Eyewitness Testimony course illustrated the value of authentic assignments to me many years ago. I had always assigned a term project in which teams of students analyzed a child testimony case according to research on memory development and then presented their analysis to the class. For years, these were uninspired PowerPoint presentations; each student presented one piece of the overall analysis, in list-like fashion, and students rarely made connections across pieces or meaningful recommendations about the case. One semester a group of students decided to produce a simulated news video as their presentation. The results were so terrific that the following semester I re-designed the assignment so that production of a simulated news video was the required product. We used the last week of class for viewings, and students voted on a Peoples' Choice Award according

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to a rubric we devised. Students were much more engaged in the project, and the quality of their work was far and above that of any previous assignment, probably because it was obvious to them that a good news video requires a coherent and cohesive analysis. Needless to say, the news video is now the regular assignment in this course. Since that time, I have incorporated authentic assignments into all my courses.

Although authentic and inductive learning tasks are beneficial for all students, they have been shown to be especially promising in promoting equity in student learning and success. For instance, when a group of instructors at Central Washington University reorganized an introductory biochemistry course around team-based, student-led scientific investigations that addressed authentic needs in the local community, they eliminated previous gender disparities in critical thinking performance, and they produced knowledge gains that were particularly dramatic for ethnic minority students. The power of these sorts of learning experiences in fostering equity were also underscored by Randy Bass's Summit presentation. In Georgetown University's new bridge program for first-generation college students interested in STEM fields, Georgetown is finding that giving students course-embedded research experience on authentic, non-academic problems is not

only promoting sophisticated learning outcomes but also is fostering a sense of belonging among these students and in the university more broadly.

Designing authentic assignments
How can you get started designing authentic assignments? Begin by identifying a major learning objective for your course (i.e., something you want students to be able to know or do at the end of the course). Next, think about what it means to think like a well-informed person in your field with respect to this learning objective. How is that demonstrated in your field? What kinds of problems or projects or tasks in your field require this understanding? What sort of opportunities could students have to show that kind of understanding in your course? Use that opportunity to identify an assignment genre (e.g., a research conference, a product design, an advertisement, an advice column, a podcast, a museum didactic/caption for a work of art).

Your next questions should be:

1. What **problem** or **question** causes someone to be interested in the topic?
2. What **role** will students play?
3. Who is the **audience** for the work?
4. How will students communicate to the audience? What **product** will they generate?
5. How will you know if they have acquired the key skill or understanding (i.e., **assess** learning)?

Program participants announced

Department Teaching Grant:
Film & Media Studies

Faculty Seminar:
Will Collins, CEA Engineering
Phil Drake, English
Abbey Dvorak, Music
Carl Luchies, Mechanical Engineering
Colin Roust, Music
M'Balía Thomas, Curriculum & Teaching
Lua Yuille, Law

Diversity Scholars:
Jordan Bass, Health, Sport & Exercise Science
Callie Branstiter, KU Libraries
John Bricklemeyer, Engineering & Project Management
Yvonne Chen, Journalism & Mass Communications
Andrew Denning, History
Randall Fuller, English
Nancy Jo Kepple, Social Welfare
Stephanie Meehan, Speech-Language-Hearing
Sarah Robins, Philosophy
Betsy Six, Law
Karna Younger, KU Libraries

DEI Action Teams:
Cécile Accilien, African & African-American Studies
Jane Barnette, Theatre
Alesha Doan & Ward Lyles, Public Affairs & Admin.
Carrie LaVoy, Curriculum & Teaching
Margaret Marco, Music
Anna Pope, Psychology

Examples of authentic learning at KU

Ill-defined homework problems

I developed a series of ill-defined homework problems for CE 461: Structural Analysis. The problems were intended to help students think more like practicing engineers and to move them beyond problems that were highly structured and constrained toward open-ended, practical engineering problems.

I used buildings and structures on and around KU's campus for this exercise. For example, I asked students to estimate the load on a particular beam in the Allen Fieldhouse parking garage. In another problem, students were asked to determine the flow of forces through part of the steel-framed structure supporting Allen Fieldhouse. In yet another problem, students were asked to determine the force distribution in a local truss bridge.

In each of these ill-defined assignments, I just provided students with a photograph and the request for the particular analysis of the structure. I did not provide structural dimensions, detailed information about the supports, a distilled schematic, or other information commonly supplied in well-defined, classic textbook problems. Instead, students had to exercise their judgment in making quality approximations and translating real structures and loads into schematics—skills that practicing engineers exercise on a daily basis.

What the students were able to accomplish with these problems was pretty amazing. Students were motivated by the need to do engineering exploration—to visit existing structures, take measurements, and begin to form their sense of engineering judgment. Perhaps best of all, students started asking the same questions that practicing engineers ask every day.

—Caroline Bennett, CEA Engineering

Understanding extinction and climate change

GEOL 121, Life Through Time, DNA to Dinosaurs, is an introductory class for non-majors and is often the only college-level science class students will take. Given that two of the most pressing issues facing humanity now—climate change and the prospect of human-caused mass extinctions—can best be understood through a geological lens, I focus less on teaching specific facts and more on increasing student understanding of the scientific method and its impact on their everyday lives.

Thus, my class is structured so students directly engage with science. Each class period, students work through activities designed to move them through the process of activating and building upon prior knowledge, using raw data to interpret, examine and craft hypotheses. These activities are done in the same assigned groups all semester, providing students with a secure environment in which to share their ideas. During the last third of the semester students prepare for their collaborative final project, a public event where teams present their findings to their classmates, the university, and the public in a creative science-fair style presentation dubbed Paleocon. This project requires teams to choose a threatened modern animal and an extinct counterpart and research their habitats, ecosystems and lifestyles. They evaluate and describe how the ancient organism became extinct and extrapolate lessons learned from that extinction to help the modern organism survive the twin specters of human-caused extinction pressure and climate change.

Since the transformation of this class from a lecture course to this new format filled with authentic learning experiences, student engagement and learning has skyrocketed: grades and attendance are up while DFW rates are down. Perhaps more importantly, assessment data reveal that by teaching through these complex, controversial and current issues, and by challenging students to directly engage with science, students have developed their critical thinking skills while gaining an understanding of the scientific method and its impact on their lives.

—Alison Olcott Marshall, Geology

From ragas to instrument petting zoos

MUSC 320: Music History 1 is the first course in a four-semester music history sequence required of music majors. The course engages with music from non-Western cultures and from ancient and medieval Europe.

In preparation for an exam that includes classification systems of instruments, I organize an “instrument petting zoo” for one class. When students arrive, musical instruments from various cultures are arranged around the room. Students are allowed to handle all the instruments and to play them. Students work in teams to classify each instrument according to the classification system assigned to them and then, at the end of the class meeting, we compare notes across the groups to understand how each system works.

In each half of the course, students work in teams to prepare four musical tasks related to musical repertoire that we are studying. Performance sections have been incorporated into course exams. On the world music exam, students must perform a drum part from an Arabic song, bell part from a West African percussion piece, mnemonic syllables used for form in Indonesian gamelan music, and a raga (melodic mode) from North Indian music. On the ancient/medieval exam, student teams sing a plainchant and three difference examples of polyphony from the 10th through the 13th centuries.

In all activities, students are expected to undertake fundamental tasks required of musicologists and/or musicians in various traditions. The instruments from the “petting zoo” were collected by me or other professors, and the classification task is a basic question in the field of organology. The performance tasks are all prepared with commercial recordings or with scores transcribed from medieval manuscripts.

—Colin Roust, Music

Meaningful choices in business law

I develop assignments in my business law course that reflect messy, complex real-world situations that require students to do what lawyers do every day: make meaningful choices and innovate. My favorite new assignment involved a woman who wanted to start a business selling breast milk in a place where it might be unlawful. Students were asked to create a video offering advice to the woman about her business plan. The goal was to help students navigate the difficult process of advising clients about the risks of their conduct, but the results were much deeper. Not only did students demonstrate mastery of the legal principles studied, but they also developed a range of innovative strategies to allow their client to pursue her business based on their own initiatives to deepen their understanding of course material and research laws far outside the scope of the course.

—Lua Yuille, Law

More than a testing ground

Instead of placing pre-service teachers only in schools, I have placed beginning teachers in community-based sites (tutoring centers, for example). Such sites enable beginning teachers to conceptualize student learning in new ways. An anchor assignment I have used for these settings has been writing fieldnotes. Fieldnotes serve as a link between describing what is happening, in a literal sense, to how events connect to larger concepts about learning. When students meet in class with peers who are working at other community-based sites, these beginning teachers have been able to talk about issues captured in their field notes. Discussion often focuses on how to translate the meaning of events into tangible action as a teacher, and they begin to experience how their perceptions of youth affect their plans for teaching. I have found that beginning teachers, through the analysis of fieldnotes, move forward in viewing teaching as a site for pedagogical decision-making rather than only a site to “try out” teaching methods. The fieldnotes, as an assignment connected to authentic learning, become a text to question, and pre-service teachers become enactors of authentic learning.

—Heidi Hallman, Curriculum & Teaching

Authentic learning and student choice

Doug Ward

CTE/Journalism & Mass Communications

Authentic assignments can be messy.

That's not a bad thing. In fact, the messiness helps students deepen their critical thinking, improve their decision-making, learn about themselves, and even take more control over their learning.

That messiness can be challenging for both students and faculty members, though. For students accustomed to a lecture-and-test format, it means grappling with ambiguity and working through failures. For instructors, it means ceding considerable control to students and devoting time to individual and group problem-solving.

Let me give you an example from a journalism class called Infomania, which focuses on research skills and critical thinking. To promote those skills, I challenge students, mostly freshmen and sophomores, to solve a problem or answer a question using information and digital tools. They work in groups to identify elements of the problem, conduct research, and create a prototype of a solution.

The results have been impressive, but the process is messy. Students must focus questions, identify sources, brainstorm solutions, distribute work among groups, set deadlines, and ultimately give shape to their ideas. I

set aside class time for group work, moving among groups, challenging their thinking, pushing for context, and guiding them toward resources.

The approach I take in the class combines elements of team-based learning and problem-based learning, combined with a dose of entrepreneurial thinking. If you plan to try something similar, keep a few things in mind:

Embrace the messiness. It takes a while for students to come to grips with the idea of controlling their own learning. I provide material at the beginning of the semester on how to do that, but students take vastly different paths. Those who have mastered test-taking often struggle the most, but all students need reassurance and guidance.

Provide choices. Choice motivates students. I rarely say no to ideas, but I spend a lot of time helping students hone their questions, think through what they really want to discover, and why they think that is significant.

Trust students. All too often, instructors set low expectations and assume that students need to be told what to do at every step. That teaches students to be passive consumers of information and of education. I've found that students respond well to high expectations. If we give students

meaningful work, they will respond to the challenge.

Give students time. I devote at least one of two classes each week to group work. Many groups still meet outside class, but time in class is crucial. Not only does it create a regular schedule for meetings, but it also provides a regular time for me to meet with groups. I can answer questions, offer advice and head off potential problems. When I encounter questions that other groups need to know about, I can then provide a mini-lecture or simply provide answers that the entire class needs to know.

Don't expect miracles. My approach to Infomania has led to such projects as a digital survival guide for freshmen, an e-book on KU traditions, an interactive guide for finding study spaces on and off campus, and a guide for matching volunteers and organizations. I've also had many shallow projects. Even with those, though, students learned to research and think through problems more effectively.

Nearly all students struggle with this process. That's important because it forces them out of passivity and empowers them to take control over their own learning. Some students see that, and others don't. Nearly all recognize the importance of authenticity, though.

Fostering first-year connections through authentic teaching

Sarah Crawford-Parker
Office of First-Year Experience

Seminars in the first year of college are an ideal location for teaching to the whole student and helping students develop their capacities as learners. The size of these courses at KU, typically fewer than 20 students, allows faculty and instructional staff to get to know students, provide frequent feedback and individualized academic support, and create opportunities for applied learning beyond the formal boundaries of the classroom. These activities are particularly critical in the first semester as students adjust to college-level learning and identify pathways into majors and learning opportunities, foundational elements that deepen and enrich an undergraduate education.

KU offers a variety of seminars for first-year students, some specific to a school or program, and others open to students who are exploring their interests or deciding on a major. More than 1,200 KU students are currently enrolled in either a First-Year Seminar (faculty-taught courses that satisfy the critical thinking learning outcome of the KU Core) or UNIV 101 (a staff-taught elective seminar on navigating the university). Both types of seminars prioritize assignments that connect course topics to opportunities for learning within the broader university context.

As part of her First-Year Seminar, GEOL 177 The Scientist: Women, Inclusion, and the Culture of Science, Alison Olcott Marshall is working with her students and the Wikipedia

Educational Foundation to increase the number of Wikipedia profiles of women scientists. The class began by collaboratively writing a profile of Cora M. Downs, KU's first woman scientist and namesake of our newest residence hall. Encountering an absence of information on the Internet, students re-focused their research on archival material in the Spencer Research Library. Students worked in small groups to produce additional biographies of women scientists of their choosing. Through the creation and dissemination of new knowledge, students are addressing a problem that carries deep meaning for their seminar: the lack of visibility for women in sciences.

Ellen C. Raimond, UNIV 101 instructor, similarly used materials available at KU to focus students' inquiry and spark their



Alison Olcott-Marshall discusses project reports with first-year students

interest in research. Students curated an exhibition at the Spencer Museum of Art on the theme of the American Dream, as explored by Ta-Nehisi Coates in the 2016-2017 KU Common Book, *Between the World and Me*. Additionally, these students produced work that had value for the campus community. Thirty KU classes from a range of disciplines visited the American Dream exhibition between March and September 2017.

Through seminars like these, first-year students are having the types of experiences previously reserved for upper-division undergraduate students, but with scaffolded support that nurtures first-year students' emerging academic skills. Equally important, students are discovering the thrill of using their knowledge in purposeful ways.

MORE SNAPSHOTS

Real science from beginning to end

After I came to KU, I resuscitated and redesigned the Biology of Fungi class, which had not been taught in several years. The central element is a semester-long group research project where students are actively doing science. As a group, students select a fungal species/group of interest and conduct primary research on it. As part of the project, students develop a PowerPoint presentation, a unique entry in the Encyclopedia of Life (EOL) on the target fungus, a poster presentation, peer reviews, and a final manuscript.

The projects that students have completed in this have been nothing short of amazing. Students learn practical research skills about identifying organisms with traditional tools as well as new molecular ones. Both PowerPoint and poster presentations hone students' skills. This helps them showcase their work at conferences and for prospective graduate mentors. With the EOL task, students develop a public resource that is published on the internet. They can easily refer to it on their CV, and employers can see their work. Peer reviews emphasize this as a critical part of the scientific process. Students doing the criticism are graded on whether it is constructive, useful and appropriate. Presenting students understand that evaluation of their work is not just from the professor, but also from peers. Students produce a paper that can be directly submitted to a journal, depending on the quality of the work. In short, they do real science from beginning to end.

—Ben Sikes, Ecology & Evolutionary Biology

Writing for the real world

In UBPL 730: Plans and Planning Processes, I ask students to rewrite a staff report for a real world case here in Lawrence. The project starts in class, where we evaluate an existing staff report. Then students are given a sample report and asked to rewrite it as a quality, traditional report that follows evaluation criteria they practiced in class. They are asked to push the envelope and rewrite the report a second time as a "21st century" staff report. Students' traditional staff reports are succinct and easy to read, and offer more information than typical staff reports. Students' 21st century reports often have links to YouTube videos showing a site or showing the student walking viewers through their recommendations. In addition, the 21st century reports are engaging and may include photos, illustrations of key terms, maps, and graphics depicting important concepts that reflect a community's values.

This assignment gives students a work sample they can include with job applications and gives them the opportunity to push the planning profession forward. I have presented sessions on staff report writing to practicing planners, and I use KU students' reports in the presentation as examples of the 21st century staff report because there are not many examples of high-quality, engaging staff reports. While this assignment is geared to training future urban planners, it could be used in creative writing, communication, and design courses. It challenges students to write succinctly first with the traditional report and then to redesign a report to engage readers and walk them through a critical analysis of a tangible project.

—Bonnie Johnson, Urban Planning

Teaching Matters is published by CTE, and edited by Judy Eddy. We welcome your comments and suggestions.

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