# Universities Encourage
# Imagination and Innovation

BY LORA SHINN

# CREATIVE APPROACHES

**Three college students had an idea.** They wanted to make a blanket that kept your feet warm—with a foot pocket. So in the fall of 2017, they went to the Idea Lab, part of the Zahn Innovation Platform at San Diego State University.

ZIP Idea Lab's founder, Kevin Popović, admits he was a bit skeptical. "We wondered, 'Why would anyone want a product like that?' But we had to suspend judgment," he says.

The ZIP Idea Lab, which is focused on helping students, faculty, businesses and nonprofits develop creative ideas that solve problems, assigned a project manager, who led the students through a six-step Design Thinking problem-solving process. The Idea Lab regularly uses this process—for more information, see the sidebar on page 97.

Through these steps, the students researched who might need and want their blanket; they surveyed other students about color, price and fabric; they brainstormed on a white-board for prototype, logo, website and methods of manufac-turing. Then they created a prototype, which they tweaked after receiving user feedback—for example, making the blanket longer.

In fall 2017, the group set up a sales table in the SDSU student union building for a soft launch of their toe-warming blanket. "They sold out of the product," Popović says, and they started a waitlist for the next order. Bomfy B. was born.

A blanket with a foot pocket might not be world-changing, but it highlights the sort of success story that can occur when universities prioritize creative thinking— thinking that is novel and unafraid to be wrong—says Popović, because creativity sets the stage for a fulfilling individual life, and for making changes on the global stage.

"From the individual standpoint, there's a sense of empowerment that comes from creativity," he says. And it's a self-fulfilling positive feedback loop, he says, because the more practice we get being creative, the more confidence we have.

Creativity also gives a competitive advantage to com-panies that hire college graduates who have developed it, says Crystal Farh, an associate professor of management at the University of Washington's Foster School of Business. "You don't want just the status quo," she says. "You want better." In addition, employees who have the space to be creative typically are more motivated and engaged, Farh says.

As a result, many institutions of higher learning are ex-panding the ways in which they encourage creativity, inspiring future generations to explore new ideas—and implement those ideas in the real world.

## CULTIVATING CREATIVE ENTREPRENEURS

In the Foster School of Business, Farh teaches a leadership class in which students practice asking good questions that inspire the brainstorming process. In one role-play exercise, leaders ask the team to write down 10 new uses for a prod-uct, assuring the team that "no idea is a bad idea."

Questions to fuel team creativity might include: How can I use this object when I go camping? Can we attach/combine other objects to this item to give it a new use? Where would this object make a good decorative ornament? The shape of this item resembles what other common objects?

The goal of the exercise is to help team members develop a kind of thinking that frees up their minds to come up with a lot of ideas—knowing full well that most of the ideas will go nowhere, but the best might turn into something amazing.

Many institutions of higher learning offer venues for stu-dents and others to apply this sort of thinking outside of the classroom. For instance, at the University of Nevada, Reno Innevation Center—Powered by Switch, users find inspiration, consultants and tools, including 3D printers and state-of-the-art software and machinery in a four-floor, 28,000-square-foot facility. The school has intentionally used the spelling "innevation" … to take the "no" out of innovation.

UNR's space has inspired the development of products ranging from low-water-use hand-washing stations that feature a special water-soap capsule to sensors that can help firefighters determine whether a building has been cleared of people.

At facilities such as the Innevation Center, students learn that failure is key to success. "Enjoy learning from failures, because you're going to have a bunch of them," advises Jim Sacherman, the center's director. "We all do. For every suc-

cessful venture, there are probably at least five that weren't successful," he says.

A student's work at the Innevation Center might lead to full-time employment, as well. Around 40 UNR students have been hired outside the program so far, by businesses impressed with their talents. "We teach what is hard to teach," Sacherman says. "How do you be a bit more thoughtful about what the world needs, and how do you come up with good ideas to make that happen?"

Another university that provides students with ways to put creative thinking into real-world practice is the University of Idaho, whose Idaho Entrepreneurs program hosts events such as the Business Plan and the Idaho Pitch competitions. In both of these events, student teams present formal business proposals to business professionals and venture capitalists. These competitions are designed to replicate the real-world process of launching a business.

Taking creative ideas to market requires teaching students to think more entrepreneurially, says George Tanner, the program's director. "It's exciting to see students and faculty come up with ideas, then work with them on a business model and plan," he says.

Thanks to programs such as Idaho Entrepreneurs, the University of Idaho's undergraduate engineering students are often well-trained in the entrepreneurial mindset. While first-year students learn and apply basic engineering tools and processes—such as designing a small model car powered by a mousetrap's spring mechanism—seniors solve engineering problems for businesses and government. Students have reworked fixtures for airplane cabin lighting for major aerospace companies and have worked on a Mars rover concept for NASA. A Northern Idaho coffee-roasting business sought more efficient ovens—three students redesigned the ovens and were hired by the business as a result, says U of I engineering professor John Crepeau.

"Engineering education has been changing over the last few years," Crepeau says. Previously, students solved specific problems similarly to math problems—go through necessary steps to get an answer. "Things are evolving now, so engineers are starting to solve more open-ended problems where there's not one answer at the back of the book," he says, leading to the design and creation of new products and businesses.
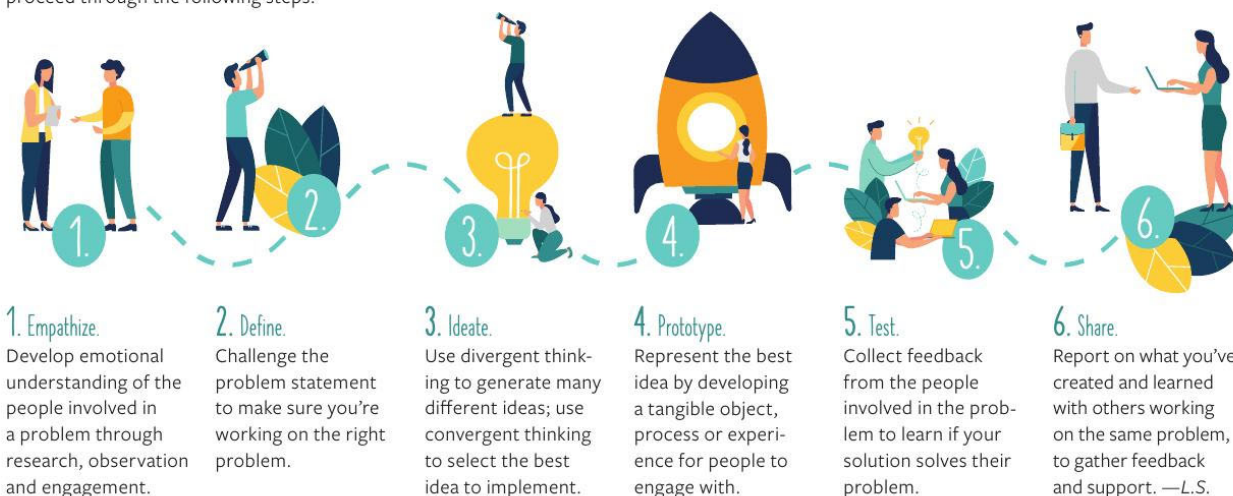
## NURTURING EARLY CREATIVITY

Some universities are training future teachers to foster creative thinking in young students so that by the time these students reach higher-education campuses, they are already

## 6-STEP DESIGN THINKING PROCESS FOR PROBLEM-SOLVING

The following process facilitates a creative approach to problem-solving. It's used at innovative schools such as San Diego State University.

After coming up with a "problem statement" (how might we?), proceed through the following steps.

**1. Empathize.**
Develop emotional understanding of the people involved in a problem through research, observation and engagement.

**2. Define.**
Challenge the problem statement to make sure you're working on the right problem.

**3. Ideate.**
Use divergent thinking to generate many different ideas; use convergent thinking to select the best idea to implement.

**4. Prototype.**
Represent the best idea by developing a tangible object, process or experience for people to engage with.

**5. Test.**
Collect feedback from the people involved in the problem to learn if your solution solves their problem.

**6. Share.**
Report on what you've created and learned with others working on the same problem, to gather feedback and support. —*L.S.*

well-equipped. When Nicol Howard, an assistant professor in the School of Education at the University of Redlands in Southern California worked as a California K–12 teacher, "students often entered the classroom nervous about learning, because they'd been expected to memorize information and perform perfectly," she says.

"As teachers, we want to develop and make room for creativity," she notes. Instead of a traditional written report, students could offer to write a poem, or create with physical objects such as clay, cardboard or various technologies.

Education that inspires creativity and supports the development of critical thinkers and flexible learners is valued within the University of Redlands' Department of Teaching and Learning. "We can't all predict the problems of tomorrow," Howard says, "but we can create opportunities for individuals to innovate and problem-solve."

Students may not get a letter grade in creativity, but they can be encouraged to build skills to create, explore and think critically when approaching problems or projects—beneficial in work settings and everyday life, she says.

University of Redlands teacher candidates go through a teacher-preparation program in which they are asked to collaborate in groups, tinker, get frustrated and figure out solutions to different challenges, just as they'll someday ask their own students to do.

The school also discusses the idea of "Genius Hour," which some public schools have adopted, Howard says. The Genius Hour is inspired by various companies' practice of allowing employees to use a portion of their workweek to explore

**Schools throughout the West are embracing creativity.**
For instance, at Montana State University in Bozeman, undergraduate student teams were asked to communicate complex physics and astronomy concepts—using art forms such as film, music and architecture. The resulting Radical Creativity Art Walk in April 2018 showcased topics such as black holes, and the interdependence of time and space. And in May 2018, MSU's School of Architecture students built a 150-square-foot "tiny house," a prototype house for the planned Griffin Village, which will provide 37 homes for homeless Bozeman residents. —L.S.

passions and interests. This exploration is integral to inquiry-based learning—or the pursuit of learning by doing, wondering and, yes, making mistakes.

"When they are given the freedom to explore, the K–12 students being taught by our teacher-program graduates often "discover passion-driven careers," she says, whether they want to grow up to work in business, medicine, engineering, biology or—in one student's case—skateboard design.

Through Washington State University's Health Education through Arts-based Learning (HEAL) program, Molly Kelton, a professor in the College of Education, and Jeb Owen, a WSU-based entomologist, are helping elementary-school-age students understand that creative thinking is very much a part of all subject matter, including health and science. Art can inform science; science can inform art; and one subject can help a student learn about the other.

For instance, when Kelton and Owen visit Eastern Washington libraries and community centers in conjunction with the program, they invite kids to draw a mosquito. Usually, the children generate a basic body, wings and a needlelike mouth. Then the youngsters learn more from Kelton and Owen about the mosquito's specific physiology, and when the children are asked to draw a mosquito for the second time, the illustrations typically contain far more detail—right down to the correct number of legs.

Kelton says higher education sometimes creates an artificial separation between the arts and sciences. "But the most persuasive and compelling science is a product of someone who has identified a new or unrecognized set of relationships between phenomena," Owen says, pointing out that science requires creative thinking: "Scientists are always striving for some new synthesis, a new perspective. That's creativity."

## INTERDISCIPLINARY APPROACH

In fact, an interdisciplinary approach is often key to creative thinking, and it's through the melding of different backgrounds that some of the most revolutionary ideas arise.

This interdisciplinary approach is on display at the University of Oregon's College of Design, which formed in 2017 as a result of a restructuring that put under one College of Design umbrella the School of Architecture & Environment; the School of Art + Design; the School of Planning, Public Policy and Management; and the Department of the History of Art and Architecture. As students learn about materials, the manufacturing process, design influences and entrepreneurship, they see how creativity is enhanced by acquiring interdisciplinary knowledge, making connections that aren't necessarily obvious, and by applying these strategies to navigate around constraints.

"There's an interaction of new materials and new disciplines," says Kiersten Muenchinger, an associate product-design professor in the College of Design. For example, some clothing design incorporates molecular chemistry and human physiology, to create items such as stretchier jeans that are more comfortably form-fitting.

By the end of their four years, UO design students might be assigned to create a chair or sitting device that blends with a company's current furniture line and costs 20 percent less to make, but can be manufactured with the company's current equipment.

Muenchinger says the hope is to graduate students who not only can think through solutions to questions, but who look at questions in entirely new ways. "If the round hole is bigger, the square peg might fit," she says. "We want to develop people who are inspired by constraints." ✈

*Lora Shinn is based in Seattle.*