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At Boise State, Innovation Drives the Economy

At Boise State, we strive not only to provide a high-quality higher education to more than 22,000 students, but also to be a vital and valuable driver of our local and regional economy.

Our efforts and accomplishments recently attracted the attention of President Barack Obama, who touted Boise State’s culture of innovation as an example for universities around the country.

“You’re the cutting-edge of innovation,” he said. “The work you do here is one of the reasons why Boise is one of our top cities for tech startups. And that means we shouldn’t just be celebrating your work, we should be investing in it.”

In his January campus visit, the president stressed the importance of providing students the opportunity to work alongside industry partners on real-world problems in real time — the kind of experiential, hands-on learning Boise State has made a priority.

“You’re also partnering with companies to do two things — you help students graduate with skills that employers are looking for, and you help employees pick up the skills they need to advance on the job,” he said. “So you’re working together. And you’re seeing progress, and it’s contributing to the economic development of the city and the state, as well as being good for the students.”

The connection, the president said, is clear — research dollars lead to new inventions, and education creates the “manufacturers who can make those inventions here in America.”

- DR. BOB KUSTRA, PRESIDENT

REPORT FINDS MOST KIDS LIKE HEALTHIER SCHOOL LUNCHES

When the U.S. Congress reconsiders funding for federal child nutrition programs this year, Boise State research associate professor Lindsey Turner will have had a hand in convincing them that healthier school meals are a valuable investment.

Dr. Turner is lead author on a first-of-its-kind study. It found that 70 percent of elementary school leaders nationwide reported that students generally like the healthier school lunches that rolled out in fall 2012.

Until the results of Turner’s study were released in the summer of 2014, the public debate had focused on kids’ initial complaints about the healthier food choices. But Turner’s research showed that kids are generally OK with the changes, and that there have not been widespread problems with kids not buying or not eating the meals.

Surveys were conducted at 557 public elementary schools roughly six months after healthier meal standards went into effect. Most respondents were either principals or school food service providers.

About half of respondents reported that students complained at first, but acceptance greatly increased by spring 2013. Very few respondents reported decreases in the number of students participating in the school lunch program, nor was more food being thrown away.

The study, written by Turner and Dr. Frank Chaloupka of the University of Illinois at Chicago, was published in the journal Childhood Obesity. - Ralph Poore
Aristotle said the whole is more than the sum of its parts. Work by Boise State University biophysicist Dr. Daniel Fologea is proving that in the race against cancer, that’s especially true.

Chemotherapy and radiotherapy are two of the best weapons in a doctor’s arsenal against solid tumors. While radiotherapy can precisely target just the tumor site, systemic chemotherapy spreads a wide net, sending drugs speeding throughout the entire body in an attempt to kill cancer cells.

Ideally, both methods would be employed at the same time, but doing so produces levels of toxicity that often are deadly. Instead, chemotherapy drugs can be administered into solid tumors by using liposomes, which are nanoscale sacs made from fats and loaded with anti-cancer drugs. Liposomes self-accumulate within the tumor, where the loaded drugs are released very slowly from their encasing.

Now a patent awarded to Fologea and co-researchers from the University of Arkansas holds promise of a way to deliver chemotherapy drugs much faster to a targeted area using radiation, without harm to healthy cells.

In the new approach, said Fologea, “The liposomes are designed to release their precious cargo upon exposure to X-ray. Not only does this target where the medication goes, it also allows for a huge concentration of the drug to be released at once at the tumor site, thus increasing its efficacy.”

Here’s how it works: liposomes have small scintillating nanoparticles embedded within them. When hit with the X-ray, they emit ultraviolet (UV) light. UV light triggers the release of Ca2+ entrapped in a photolabile cage inside the liposomes. The free Ca2+ activates an enzyme called phospholipase A2 that starts chewing the fats in the wall of the liposomes and triggers the fast release of the drug.

Researchers have a patent on the technique but still expect several years of testing before the method is approved and available for cancer patients. – Kathleen Tuck
PROSPERITY KEEPS THE NIGHT LIGHTS BURNING

Satellite images of cities from space resemble constellations, and their intricate celestial patterns hold a wealth of information for economists and social scientists.

Dr. Michail Fragkias, assistant professor of economics, is using satellite imagery to estimate energy use and wealth in cities in the United States and around the world. As an applied economist and interdisciplinary social scientist, Fragkias works broadly on issues of urbanization, land use and the environment. In parts of the world where reliable socioeconomic information is not available, such as economic census data and gross metropolitan product, Fragkias can translate satellite images of nighttime lights into economic output.

“Outside of the United States, there are just a few places in Europe that do a good job of measuring the economic output of cities,” he said. “In parts of the world where we can’t find good socioeconomic information, we need to use proxies in order to understand key characteristics of growing urban areas for business and sustainability.”

Satellite images that capture the luminosity of human settlements have been collected since the 1970s, but scientists have just begun in this decade to fully utilize them. Fragkias, together with collaborators at Arizona State University and Yale University, has been exploring multiple global datasets on nighttime lights since 2012. He has developed algorithms that utilize nighttime light data for projecting the gross metropolitan product of cities.

In addition to gauging economic output, nighttime light data can help estimate damage from wars and instability or answer questions about health epidemics.

“The research in this field is new enough that we’re still trying to establish all of the potential uses for the data,” he said. – Sherry Squires

THE CASE OF THE MUMMY’S FACE

A microscopic sliver of painted wood could help unravel a centuries-old mystery — the identity of the “Bearded Man, 170-180 A.D.,” whose portrait adorned the sarcophagus sheltering his mummified remains.

Figuring out what kind of pigment was used and the exact materials used to create it, could help scientists unlock the man’s identity.

“Where the pigment came from may connect it to a specific area and maybe even a family,” said Dr. Darryl Butt, a distinguished professor in the Department of Materials Science and Engineering and associate director of the Center for Advanced Energy Studies (CAES).

For years, researchers were limited by the lack of samples large enough to be properly analyzed. But advances in the field of nanotechnology mean scientists now can work with fragments tinier than the eye can even register. Using state-of-the-art capabilities at CAES, Butt and his colleagues worked with a sliver of pigment smaller than the diameter of a human hair.

Researchers have extracted five needle-tip sized fragments 20 nanometers wide (a nanometer is a billionth of a meter), as well as two thin foils. From that, they have been able to analyze and map out the chemistry of the material in three dimensions.

“These are very vibrant synthetic pigments, possibly heated in a lead crucible,” said Butt. “People thought that process had been developed in the 1800s or so. This could prove it happened a lot earlier.”

While studying the provenance of mummies is new at Boise State, Butt said that similar transdisciplinary projects could open up opportunities for students to travel to various facilities or museums to carry out research. – Kathleen Tuck
Racetrack Playa, a seasonally dry lakebed in Death Valley National Park, is home to one of the longest-standing mysteries in Earth science.

Extending out from rocks ranging from pebbles to boulders weighing hundreds of pounds are shallow furrows in the playa’s clay surface, some running parallel to others for hundreds of feet. But even though scientists have visited the playa for decades, the sailing stones had never been observed in motion.

Until now.

In 2007, with permission from the National Park Service, Boise State physicist Brian Jackson teamed with John Hopkins University’s Ralph Lorenz to determine the conditions that drive the rocks, and perhaps even see them in motion.

Time-lapse imagery collected over six years from the researchers’ cameras showed large winter storms often buried the playa in snow, which would then melt to form mirror-smooth ponds that frequently re-froze.

This ice probably reduced the friction and even formed floes that could push or buoy the “sailing stones,” allowing very light winds to move them. Nobody knew for sure.

Finally, in December 2013, a research team including Lorenz and Jackson and led by Richard Norris of Scripps Institution of Oceanography observed the rocks in motion.

Members of the team discovered a shallow pond less than 3 inches deep, with many rocks encased in thin ice floes two-tenths of an inch thick. Shortly before noon, the ice floes began breaking up, and 10 mile-per-hour winds propelled some rocks a few inches per second.

The researchers also observed trails formed in the playa’s muddy surface by ice floes.

These observations confirm that, aside from their unusual journey, there’s nothing special about the stones themselves. Instead, their motion results from the convergence of atypical meteorological conditions: the right combination of water and ice to push the rocks while leaving their keels to drag in the playa’s surface, along with sufficient winds.

A research grant from NASA will allow a team of geoscientists to continue their work on two of the most important issues impacting the West — water and fire.

Dr. Nancy Glenn and Dr. Alejandro (Lejo) Flores received a three-year $748,000 NASA Terrestrial Ecology grant to help track the impacts of climate change, population growth and fire on the vegetation of Western dryland ecosystems.

They will collect data using remote sensors on planes and satellites, and then create models that take full advantage of that data to establish baselines for water and ground vegetation, and predict future scenarios of vegetation for the Great Basin states.

“In a lot of ways, the West is still a frontier as far as research is concerned,” Flores said. “A day’s drive from the Boise State campus in any direction positions us to address a lot of these pressing issues.”

The NASA grant is the third Boise State recently received that is aimed at understanding water and the Western landscape. Flores, who earned his doctorate in hydrology from the Massachusetts Institute of Technology, received a prestigious National Science Foundation CAREER award in 2014. The $457,205 five-year grant addresses how activities such as forest thinning, prescribed burns and fire restoration affect regional precipitation, snow storage, soil moisture and runoff in Idaho. – Sherry Squires
That’s the power of research. A power so strong at Boise State University that it recently attracted a $10 million grant from the National Institutes of Health (NIH). The five-year award will be housed within the university’s Biomolecular Research Center and administered by Dr. Julia Oxford, biology professor and center director.

And that’s just one example of the university’s research-related efforts to strengthen economic development by fueling commercial activity, training a robust workforce and increasing the area’s standard of living and overall quality of life.

“Without research, we couldn’t come up with an end product that is useful to society,” said Dr. Mark Rudin, vice president for research and economic development at Boise State. “Research leads to discovery and then, we hope, to applications within the community.”

Those applications are all over the board, affecting individuals, government agencies, medical practice and more.
Dr. Allan Albig, assistant professor of biological sciences, is looking at extracellular matrix in the calcification of the cardiovascular system. He and others have determined that the Matrix Gla Protein (MGP) is associated with heart attack, cancer and stroke, yet its role is poorly understood. His project explores the biological mechanism by which MGP governs these health issues.

A sampling of current research activity at Boise State includes:

- Creating self-adjusting vents that equalize heating and cooling in homes or businesses
- Digitizing the marked and annotated books that survive from the library of author Herman Melville
- Developing self-powered thermoelectric sensors that help keep tabs on what’s happening inside a nuclear plant in the wake of a disaster
- Producing a flute CD project inspired by the contemporary music of Slovenian composers Blaž Pucihar, Črt Sojar Voglar, and Peter Kopač
- Exploring electronic chips that enhance the intelligence of both piloted and autonomous vehicles
- Developing data to inform biodiversity conservation policy and planning, with a mission to keep common species common
- Identifying how demographics, geography and other variables affect the well-being of the maternal and child health populations in Idaho

“University research strengthens Idaho’s economy by providing an environment that fosters the inception of new technologies, innovative solutions and viable products,” said Jeff Sayer, Idaho Department of Commerce director. “Idaho is fortunate to be home to three world-class research universities that each serve as an investigative partner in advancing concepts into reality, moving theory into actuality and transforming projections into economic revenue.”

**SOLVING MAJOR HEALTH ISSUES**

Dr. Oxford’s $10 million grant will establish a prestigious Center of Biomedical Research Excellence (COBRE) in Matrix Biology at Boise State. Nationally, COBRE centers augment and strengthen institutional biomedical research capabilities. They support basic, clinical and translational research as well as faculty development and infrastructure improvements.

“An award of this magnitude is recognition of the high-quality research being done by Boise State’s biomolecular faculty investigators and will allow us to increase our biomedical research efforts,” said Dr. Bob Kustra, Boise State president. “It demonstrates that our researchers are contributing to solving the major health concerns of the nation.”

The grant is part of the Institutional Development Award (IDeA) program, which broadens the geographic distribution of NIH funding for biomedical and
Dr. Kristen Mitchell, associate professor of biological sciences, is exploring the connection between liver fibrosis and extracellular matrix overproduction. Mitchell’s research investigates the role of aryl hydrocarbon receptor signaling during myofibroblast activation (which causes collagen to form in the liver) and the development of fibrosis, which is a precursor to cirrhosis.

Several recent accomplishments prepared Boise State for this major award, including establishment of Idaho IDeA Network of Biomedical Research Excellence with several partner institutions; approval for a biomedical research vivarium; and a doctoral program in biomolecular sciences.

In the end, all these efforts allow the university to provide better opportunities for students, which in turn prepare the next generation of researchers, thinkers and skilled employees.

“The applied experiences Boise State students get through hands-on research and internships help develop 21st-century skills, especially critical thinking,” said Mary Andrews, director of economic development in the Division of Research. “Students are experimenting and integrating what they learn into a new hypothesis, and that is one of the most, if not the most, important skills in our economy.”

One example is the university’s Venture College, which helps students learn how to launch actual businesses. The program has essentially taken critical thinking skills outside the traditional classroom, allowing participants to hone skills in real time.

“To me, that is what’s really exciting,” said Andrews. “The maturity they gain by having their hypothesis invalidated, then taking what they have learned and creating a new hypothesis, is invaluable.”

The university’s robust research program also has captured the attention of industries attracted to the possibility of partnering with researchers in the discovery phase, using lab space or hiring students and graduates.

That’s good for the economy and for Boise State students, said biology professor Jorcyk.
“Students need places to intern that are local and a place to work when they graduate,” she said.

Jorcyk, whose research looks at the cellular proteins that cause breast cancer metastasis, notes that research that ultimately benefits the community, and by extension the economy, is more successful and satisfying.

“I was reading an article that said that the reason why we do something contributes to how successful we are,” she said. Thus the more beneficial the work is to the masses, the more likely researchers will be to stick with it and be successful.

A REAL-TIME ECONOMIC IMPACT

There’s also a very real immediate impact when a research project is funded by a granting agency, resulting in more money in local pockets.

“If as a university we lead in marketing — partnering with industry in the region — we can have a huge economic impact on Idaho, providing good-paying tech jobs and other employment,” said Dr. Peter Müllner, a distinguished professor of materials science and engineering.

Müllner’s work on magnetic shape memory alloy has generated $3 million in spending since 2004, with funds going toward salaries, supplies and equipment. Financial support has come from the Micron Foundation, National Science Foundation, the Idaho Higher Education Research Council, U.S. Department of Defense and more.

That investment also has resulted in a boost to Boise State’s reputation, attracting researchers from around the world — including China, Poland, the Basque Country, Germany, Switzerland and Spain — to use his unique lab.

“It’s incredible when you see research labs that have good collaboration between science and product development,” said Dr. Trevor Lujan, assistant professor of mechanical and biomedical engineering.

“They become a training ground as researchers learn how to prove a concept and make it marketable.”

Lujan noted that the NIH, NSF and other granting agencies are putting more emphasis in the proposal stage on possible patents, licenses and product development. This emphasis on “bench to bedside” research allows an investigator’s work to have a more direct impact on people’s lives.

“It’s shifting the success of our labs with fewer
degrees of separation between the work we are doing and changes in technology,” Lujan said.

And success breeds success. As Boise State garners more prestigious grants like the NIH COBRE award, it becomes more competitive for other grants.

“By continuing this effort, Boise State is in a better position to attract this type of activity to us, contributing in even bigger ways,” Oxford said.

Oxford believes there is one more reason university research activity should contribute to the bottom line: your tax dollars.

“When we receive grants from federal government agencies like the NIH and NSF, those are your tax dollars at work,” she said. “So we are employees of every single taxpayer and it’s our responsibility to benefit those who contribute.

“As Boise State continues to do important federally funded inquiry, researchers are charged with addressing the most pressing needs of our citizenry.”

Defining economic development is as challenging as ensuring its growth within the community. At first blush, many would say it’s the development of new products, industry or jobs.

That’s a good start. But it goes deeper than that, touching on intellectual property, creative output, knowledge transfer and so much more.

“Economic development is proactively looking for opportunities to maximize and leverage the assets we have here at Boise State University and partnering with industry and community members to advance our quality of life,” said Mary Andrews, director of economic development for the Division of Research and Economic Development.

Those assets can be a number of things, including student research, faculty expertise, labs, field sites, inventions and new product development. It also includes the workforce skills necessary to propel industry to the next level.

Developing those assets requires good, solid research.

“We’re hard pressed to develop intellectual property without basic research,” said Dr. Mark Rudin, vice president for research and economic development. “But it’s not always easy to see the direct link between the two. It’s really a process.”

Grant funding agencies understand that process and recognize its value in key research areas. Their investment may not pay off for a number of years, but they know that financial support can provide the extra “oomph” to keep innovation moving forward.

Economic development has a human element to it as well. It’s about generating the researchers who are taking key roles in the medical, high-tech, and research and development communities.

“It’s about people capital,” Rudin said. “We’re training future scientists, artists, health care professionals and others to discover things for themselves.”

There has been a lot of academic research conducted on the connection between research and economic development. Based on the findings of those studies, Boise State is attuned to the metrics that measure success at the highest levels.

“But we also are an urban university and Boise is our city,” Andrews said. “Community and industry here are our No. 1 priority. In addition to everything else, we want to make sure we have local impact.”
At Boise State, the Office of Technology Transfer manages intellectual property commercialization for the university, from assessment and protection to development, licensing and marketing.

That can involve filing a patent to protect new ideas created during research, as new grants are being sought for further technological development or while kinks are being worked out. It also often involves partnering novel technology, skills and methods with private or public industry, where it can then be developed further and, if applicable, commercialized into a product or spin-off company.

“The transfer of technology out of a university requires a vigorous, committed tactic that includes involving researchers, advocating for the technology and locating industry partners who will use that technology and bring it to market,” said Katy Ritter, director of the Office of Technology Transfer. “We hope that the result of our activities includes the introduction of new products into the marketplace, an increase in high-quality jobs in Boise and the state of Idaho, and general economic benefit.”

Read on for a look at the Road to Technology Transfer, as experienced by researchers in disciplines across campus.
Discovering the latest and greatest widget, software application or cancer treatment can do wonders to boost a researcher’s academic reputation and attract future grants.

It won’t, however, begin changing lives until it gets into the hands of the people who need it.

That process, called technology transfer, is key to strengthening university and community ties and contributing to economic development.
Imagine a device that uses magnetism to transfer electrical energy into motion, without the use of any rotating parts.

Peter Müllner did and is now working to market the incredibly small Motionless Magnetic Shape Memory (MSM) Micropump.

In MSM technology, a magnetic field is applied to a material, causing it to respond with a shape change that remains when the field is removed. Apply a different magnetic field and the material forms into a new shape. Repeat this quickly and with purpose and you have a small motor or pump.

Built by Müllner’s students, the device already has been used in research aimed at delivering minute volumes of drugs in the lab of Martin Vreugdenhil at the University of Birmingham in England. Müllner expects the novel pump to find many other applications as well.

“Anthracyclines are used to fight a whole variety of cancer types,” Warner said. “The trouble is that the dose is limited. You can take a certain amount for a certain period of time, and then you are done. Beyond that it can cause life-threatening congestive heart failure.”

But reducing that risk also reduces the drug’s potency. Warner’s team is working to restore its effectiveness without the harmful side effects.

“We are synthesizing the drug and conducting preliminary preclinical trials,” Warner said. “We’re testing it against a wide variety of cancer cell types to see how effective it is. Then we will test it in living systems.”

Their research to date has been supported by a grant from the Idaho Global Entrepreneurial Mission (IGEM). Warner hopes that success in these early stages could lead to a technology transfer grant from the National Institutes of Health aimed at helping small businesses engage in research and development with a strong potential for commercialization.
Cows are big business in Idaho, where a nasty case of mastitis can spell disaster for large and small dairy farms alike.

Research by Dr. Juliette Tinker, associate professor of biological sciences, could help.

Tinker is developing a vaccine for Staphylococcus aureus, a bacterium that is a significant source of mastitis in dairy cows. Her work received a patent in September, and two more patents are pending.

Infections often can be treated with antibiotics, but the medication taints the milk, making it illegal to sell and undermining the bottom line.

“Vaccines are really big right now because they can reduce the demand for antibiotics,” Tinker said.

Tinker currently is experimenting with the best way to deliver the vaccine. Original plans called for nasal delivery, but she now is looking at the udder or vagina as possible options. To find out which method works best, she’ll have to set up trials with real dairy cows.

To make that happen Tinker turned to her industry partner, Dr. Brian Mitchell of DairyTeam. A veterinarian with a master’s degree in immunology, Mitchell was able to connect her with a local commercial dairy. Four trials currently are set up over the next year and Tinker hopes for positive results.

“We couldn’t do large-scale research to move ahead without collaboration with industry,” Tinker said. “U.S. Department of Agriculture grants are not large enough for larger-scale studies. And a lot of good interaction can also come from these collaborations.”

Benefits include an exchange of ideas and also a few economic advantages. For instance, licensing the vaccine following testing can help support further research.

“If we get positive results, we expect more interest from industry,” she said.
Water is the lifeblood of Idaho, and the best predictor of whether we’ll have enough to get us through the dry summer season is the winter snowpack. But those life-giving crystals often spark a love-hate relationship. Although we desperately need snow, we know we can’t always trust it to remain stable.

The avalanche industry in Idaho is vast, comprising U.S. Forest Service forecasting centers, backcountry outfitters, ski resorts, the Idaho Department of Transportation and more. And that’s a reality repeated in most Western states.

As a Boise State doctoral student in geosciences, Dr. Scott Havens focused his research on better measuring and understanding snow and attendant avalanche hazards.

In October 2013, while still a student, he formed Snowbound Solutions LLC, which provides real-time graphical weather information for snow and avalanche industry websites. Information relating to water data and avalanche threat generally is presented in a table, which is difficult to read and even more challenging to interpret in terms of avalanche threat.

Dr. Trevor Lujan, MECHANICAL AND BIOMEDICAL ENGINEERING
RESEARCH: TESTING HIP RESURFACING TECHNOLOGY FOR CANINES
INDUSTRY PARTNERS: MWI VETERINARY SUPPLY, WESTVET

Working with MWI Veterinary Supply and WestVet, engineering assistant professor Trevor Lujan is hoping to support the development of a viable alternative treatment at a fraction of the price — a canine implant that only replaces the articulating surfaces on the hip joint.

MWI developed the product, based on collaborations with local surgeons at WestVet. Lujan is creating a way to test its effectiveness and durability.

A new testing apparatus created in his lab will simulate a year of canine activity in just a week’s time.
In 1977, a group of Boise State alumni joined other local actors to put on a show. Finding that licensing fees, or royalties, for producing a modern script were beyond their means, they decided to tackle a royalty-free Shakespeare play instead.

That production launched what today is the highly successful Idaho Shakespeare Festival, which stages five plays each summer at its outdoor amphitheater along the Boise River near Barber Pool and offers educational outreach programs across the state. A dedicated core of Boise State faculty, students and alumni continue to be key contributors to the program.

"From the founding of the Idaho Shakespeare Festival in 1977, Boise State faculty, students and alumni have played a critical role in the extraordinary growth and success of the company," said Charles Fee, producing artistic director of the Festival.

"In the past year alone, six faculty from the Department of Theatre Arts were employed as professional members of the Festival company: acting, designing, coaching and serving in technical capacities, both in Boise and with the Lake Tahoe Shakespeare Festival in Nevada."

In addition to faculty, the 2014 company included 22 current Boise State students and alumni working in every aspect of the company — from leading roles onstage to administrative and technical positions.

"Boise State also plays a role in developing and deepening the professional staff of the Festival through a generous sponsorship that provides continuing education opportunities at both the undergraduate and graduate levels," Fee said.

Dr. Gordon Reinhart, head of the acting and directing emphases in Boise State’s Department of Theatre Arts, said: "When I work out there, I’m struck by the powerful feeling of community and by the seeming health of our community."

Reinhart also noted the importance of art to a region’s economic well-being: "It seems to me that there is no economy to develop without such a thing."

“This apparatus will replicate the same loads and motions as a canine trotting, and simulate the temperature and lubricants of the hip joint,” he said.

Hip resurfacing has been around for about a decade, but the materials currently in use aren’t achieving expectations. If this project results in a better option, Lujan hopes the device could eventually help people.

“Engineers are constantly coming up with new materials, allowing us to rework technology that didn’t originally meet our expectations,” Lujan said.
Idaho has a healthy food processing industry — thanks to its thriving agricultural economy — and one local company has found a way to clean up in that field.

BHS Specialty Chemicals, based in Nampa, Idaho, specializes in environmentally responsible and sustainable ways to clean industrial food processing equipment. The company seeks to recover waste and cleaning products that otherwise would feed into the wastewater system and repurpose them to create new products. Where many see waste, BHS sees opportunity, and they have leveraged that opportunity through a partnership with Boise State University.

“As researchers, we often develop new technology and then look for a place for it out in the marketplace,” said Dr. Owen McDougal, chemistry professor and lead faculty on the BHS partnership. “These kinds of industry partnerships are different in that they allow us to work alongside industry to meet their specific needs and develop new products together. That’s a winning formula for all of us.”

BHS is one of the university’s earliest industry partners among a growing number across academic disciplines, from chemistry to engineering, biology to health care.

“Creating applied experiences for students and performing real problem-solving for industry is a win-win,” said Mary Andrews, Boise State’s director for economic development. “Partnerships enrich education and the preparation of graduates, provide opportunities for joint research and project development, and engage faculty and students in local and global issues of today.”

Dr. Owen McDougal, far left, is working with BHS team members Ben Parker, Blaine Carter and Phil Johnson on a food processing project.
BHS and Boise State

BHS and Boise State began working together about six years ago after the university landed some sizeable National Science Foundation grants and acquired an $825,000 nuclear magnetic resonance spectrometer and a $677,000 mass spectrometer. The equipment opened the door for sophisticated research into the kind of chemical compounds being developed by BHS.

Currently Boise State is performing chemical analysis to help reformulate waste products to make them more compliant with new U.S. Food and Drug Administration regulations and more friendly to the environment.

“It makes sense for us to partner,” said BHS CEO Phil Johnson. “Our company has a desire to grow. Boise State University is doing fundamental research that is needed in our industry and we can do more together.”

The industry partnership has allowed Boise State to be more competitive for research funding. In addition to new equipment, both BHS and the university have hired new doctoral scientists to help further their joint work.

Jacob Smith, a junior from Stanley, Idaho, who is studying biochemistry, also is part of the team.

“It’s exciting to be working on real problems that need to be solved,” he said. “It makes learning feel like it has a purpose, and no doubt makes my university degree more valuable.”

Ben Parker, a 2009 Boise State graduate who is now BHS’s research and development manager, leads the efforts for his company.

“We are really pushing the envelope on what can be done in this field, and the chemistry and the types of things we’re doing are not really taught in schools,” Parker said. “So we also are helping to develop a pipeline of students who could roll into our industry. We have found that Boise State really wants these kinds of relationships and it’s a great opportunity to build specialized expertise for Idaho from the ground up.”
Future opportunities

BHS is growing and adding high-skill, high-paying jobs in Nampa. The success of its work with Boise State holds potential for even greater payoff in Idaho and the West, where agriculture and the food processing industry are vastly important to the economy.

The BHS project also is building core competencies at the university, which are leading to more partnerships for Boise State in food processing chemistry. The long-term goal is to create a research center for excellence, according to McDougal. It would be the only one of its kind in the region.

“The BHS partnership has been a test case for the university on how we can do these things,” McDougal said. “We are working through the process together, and Phil and Ben have really been committed to fostering a relationship with us.

“We all understand the benefits – it’s food processing, it’s agriculture, it’s chemistry, it’s Idaho. There are a lot of jobs in food chemistry and it’s a niche that’s not being filled in an agricultural state.”

BOISE CITY DEPARTMENT OF ARTS AND HISTORY

Working with Boise Mayor David Bieter, history professor Dr. Todd Shallat organized the Office of the City Historian in 2004 to help the city re-establish tradition by reclaiming its history. The position was attached to the Mayor’s Office, with support from the Boise City Council.

GOALS INCLUDED:

1) Giving city departments the historical information they needed to make informed decisions about the future of programs and property
2) Organizing and preserving valuable records and objects
3) Promoting civic identity through historical programs and landmarks

Boise State funded a graduate assistantship for a city historian who worked under Shallat’s direction. The city matched that with its own funding for programming. The office was filled by graduate students Amber Beierle, Ann Felton, Tully Gerlach and Brandi Burns.

What began as a reference and research desk, mostly answering questions about historic places and urban renewal issues, eventually branched out to include artifact preservation, archival guides, galleries, essays and public events such as the Boise City Sesquicentennial and the Fettuccine Forum.

After six years, the office merged with the Arts Commission to become the Boise City Department of Arts and History. It has won national recognition for quality programming.

CURRENT EMPLOYEES WITH BOISE STATE CONNECTIONS INCLUDE:

KAREN BUBB, public arts manager, Master of Public Administration and Graduate Certificate, Regional and Community Planning, 2008

RACHEL REICHERT, community relations coordinator, Bachelor of Fine Arts, 2007

BRANDI BURNS, history programs manager, Master of Applied Historical Research, 2011

KACI NICKS, Boise State University Historian Fellow

KARL LECLAIR, Sesqui-Shop Assistant, Bachelor of Fine Arts, printmaking, 2013
Boise State University is working to make Idaho a place where entrepreneurs, inventors, business owners and manufacturers can push on any door and find it open to the support they need to succeed.

These players in economic development often face complex technical problems in the design and prototype of new products that they don’t have the expertise or equipment to solve. That’s where Boise State comes in.

President Barack Obama highlighted that distinctive quality of Boise State when he visited the university in January. “The work you do here is one of the reasons why Boise is one of our top cities for tech startups,” he told the crowd gathered for his first stop after his State of the Union address.

While on the Boise State campus, the president visited the New Product Development (NPD) Lab, one of the ways the university helps inventors bring their ideas to reality. For example, Mark Melni, a classically trained pianist, spent most of his adult life working with computers and wires. Crimping wires in the traditional manner was wearing out his hands and those of his staff at Microchips Etc.

Melni came up with an idea he called the Melni Electrical Connector. The connector had a design concept similar in principal to a finger trap toy. A simple twist of the invention’s end caps produces an electrical connection.

Using 3D modeling and solid prototyping, an NPD Lab team of mechanical engineers, professors, engineering students and an artist helped Melni evolve his concept into a patented product. His initial purchase order of $550,000 exceeded first-year production estimates by 10,000 units of the device, which are manufactured in Meridian and Twin Falls.

“We’re making the tremendous research expertise and millions of dollars’ worth of specialized equipment at Boise State available to business and industry,” said Dick Sevier, coordinator of C-TAP, which is short for Center for Advanced Energy Studies (CAES) Technical Assistance Program. CAES is a research and educational partnership of Boise State University, Idaho State University, the University of Idaho and the Idaho National Laboratory.

To solve problems brought to C-TAP, Sevier seeks help from researchers in chemistry and biochemistry, physics, geosciences, materials science and engineering, computer science, electrical and mechanical engineering and others.
Boise State supports a number of area industries that provide a variety of innovative products, including 1) confections from Idaho Candy Company; 2) a robot from House of Design; 3) a sampler from Brave Girls Club; 4) hand-poured pewter jewelry from Bliss Stamped Jewelry; and 5) a T-800 Makerbot from STEMfinity.

Left: President Barack Obama visits with Boise State College of Engineering Dean Amy Moll, engineering student and lab engineer Chris Brown, and lab manager Calvin Allan in the New Product Development Lab in January 2015.
Currently, C-TAP is working with Jana Kemp, a local entrepreneur who has an idea for a product that uses motion-capture technology.

“C-TAP is coordinating this work between Jana and Boise State’s Center for Orthopaedic and Biomechanics Research and also facilitating interdisciplinary discussions with Drs. Steve Cutchin and Anthony Ellertson of the Department of Computer Science,” Sevier said. “They each conduct research relating to computer graphics, an integral component of Jana’s product.”

Many of the technological solutions business people are looking for are housed under the College of Business and Economics (COBE) umbrella of business assistance centers.

“The business community wants the latest thinking, so they bring their problems to us,” said Dr. Ken Petersen, COBE dean. “There shouldn't be a wrong door when someone needs assistance from Boise State University.” Thanks to the university’s transdisciplinary nature, some of those problems may get solved by engineers, and others may be solved by artists.

One example is when Medtronic Inc., the world’s largest medical technology company, asked for help showcasing a model of a new stent, a small mesh tube that’s used to treat narrow or weak arteries. The challenge was to create a strong, large-scale, high-quality model that could demonstrate technology imperceptible to the naked eye for display at a Paris trade show.

TechHelp, which provides technical and business assistance to manufacturers, worked with a staff artist who prepares exhibits for trade shows. Using a 3D printer, the artist created a workable model that Medtronic could take to the Paris show.

“In the end it was a stent scaled up nearly 100 times normal size, illuminated from within to showcase a new means of drug delivery,” said Calvin Allan, new product development manager for TechHelp.

“We work with companies to help them grow and be more competitive globally,” said Steve Hatten, TechHelp executive director. “Students, especially, have been amazing contributors to this success, while at the university and afterward.”

President Obama pointed out that Boise State is partnering with companies to do two things. “You help students graduate with skills that employers are looking for, and you help employees pick up the skills they need to advance on the job,” he said. “So you’re working together. And you’re seeing progress, and it’s contributing to the economic development of the city and the state, as well as being good for the students.”

Allan (MS, mechanical engineering, ’06) was one such student. Allan had been a student intern with the NPD Lab, which is housed in the College of Engineering and staffed by the TechHelp NPD team. He and the rest of the team of professionals and engineering students helped local inventor Caleb Chung launch his animatronic pet dinosaur toy called Pleo.

Pleo is designed to mimic the imagined behavior of a baby Camarasaurus. The original Pleo used 38 sensors, 8 computer processors and 14 motors to “learn” from its experiences and develop a distinct personality.

The Boise State team assisted with computer-aided design, provided ideas and advice on manufacturing and Boise State can help inventors bring their ideas to reality.
Launched in 2007, Pleo has since been acquired by a Hong Kong company, which has issued a second generation of the toy with even more artificial intelligence. Chung continues to pursue other inventive ideas with the NPD Lab.

“It was a phenomenal opportunity,” said Allan, who after graduation went to work for Chung’s UGOBE company as a mechanical design engineer.

“Students understand the value of our consulting services,” Hatten said. “After they enter the professional world, they refer companies to Boise State University when those companies need help.”

Other doors also eventually open into the services offered by Boise State. “One great thing about Idaho is that all of the service providers know each other and we know each other’s roles,” said William Mullane, TechHelp marketing manager.

For example, when Boise-based Rekluse Motor Sports owner Al Youngwerth sought help to grow his company’s international sales, his marketing team approached the U.S. Commercial Service. The Commercial Service is one of Boise State’s partners in promoting economic development in Idaho and helped connect Rekluse with the international business experts at the university.

Startup companies also can find the help they need through the Boise State Technology and Entrepreneurial Center, or TECenter. Located in Nampa, the TECenter offers start-up and early-stage technology company entrepreneurs the expertise, networks and tools they need to succeed. The TECenter is affiliated with the Idaho Small Business Development Center, which is supported by the College of Business and Economics.

One of the center’s recent success stories is BookLamp, which developed big data-style book analytics services. In 2014, Apple acquired BookLamp for between $10 million and $15 million in an effort to be more competitive in the e-book retail space.

“Every time a startup leaves the center, capital is injected into the local economy and more entrepreneurs become experienced in the process of starting, building and growing successful local companies,” said TECenter Director Denise Dunlap.

“There are many great examples of how Boise State University helps businesses in the state and beyond,” said COBE Dean Petersen. “At Boise State, we have the ability to reach outside the classroom and provide value that directly impacts the Idaho economy.”

AT A GLANCE

TECenter | bsutecenter.com
The Boise State Technology and Entrepreneurial Center, or TECenter, helps startup companies continuously improve and grow. The TECenter has worked with more than 100 entrepreneurs who since 2008 have generated $37 million in sales, have more than $12 million in invested capital and have created 295 jobs.

TechHelp | techhelp.org
TechHelp can deploy university staff, faculty and student resources to provide consulting assistance and training to manufacturers, food and dairy processors and inventors across Idaho. With TechHelp, these businesses can grow revenues, increase productivity and performance, and strengthen their global competitiveness. TechHelp is a partnership of Boise State University, University of Idaho and Idaho State University. It is Idaho’s affiliate of the National Institute of Standards and Technology Manufacturing Extension Partnership and a U.S. Economic Development Administration University Center.

Idaho Small Business Development Center | idahosbdc.org
The center provides business consulting and training to Idaho’s small businesses, which create most of the state’s new jobs. In its 25 years, the center has served 27,700 clients who have created 8,225 jobs and who have seen sales increases of $801 million.

Center for Advanced Energy Studies Technical Assistance Program (C-TAP) | research.boisestate.edu/ctap
This new program seeks to engage Boise State’s resources to help solve tough scientific and technical problems facing Idaho companies. C-TAP can direct customers to the right people quickly and provide project management assistance.
When Metageek’s Brian Tuttle (official title: Geek Herder) needs a new geek for his herd, he knows where to turn: The Department of Computer Science at Boise State University, where Tuttle earned his own degree.

The department has provided this Boise high-tech firm that specializes in wireless tools with a steady supply of student help and future employees. In fact, the relationship is so important to Metageek owner Ryan Woodings that the company is a main partner with Boise State, the state of Idaho and several other local tech firms in a plan to double the number of computer science graduates Boise State produces.

Internships are one of the best ways that students can take the skills and competencies they have learned in the classroom and the laboratory and put them to the test in the working world. Boise State places more than 1,300 local interns a year.

More than 9 out of 10 Treasure Valley employers told the Boise State Career Center that they expect their entry-level professionals to have had a practical learning experience, such as an internship.

At Metageek and companies all over Boise, these internships can turn into first jobs. But internships are just the start of what Boise State is doing to prepare its graduates for success beyond the diploma, and for good reason.

“When you and I graduated, employer expectations weren’t as high,” said Debbie Kaylor, Career Center director.
IDENTIFYING THE PATHWAYS TO CAREER READINESS

Today, universities see more first-in-their-family college students, a broader access for students from all income levels and a generation of incoming freshmen who have lived through the Great Recession. Many of these students are taking career readiness to heart. Recent studies show that those who don’t may face years of underemployment.

In short, the diploma isn’t enough. “You can’t just have that piece of paper in hand,” Kaylor said. “I think employers are really looking for a package — it’s your major, it’s your skills, it’s your experiences.”

Undergraduate research can be a boon for future employability. “I think that students who are involved in research have a leg up on students who are not,” said Dr. Mark Rudin, Boise State’s vice president for research and economic development. “I think from a professional development opportunity, you are learning skills in the laboratory, in the field and in the studio. I think that creates a more well-rounded student and a more competitive student in the workplace.”

Freshmen begin hearing at orientation about other ways they can start to build their resumes. The list is longer than many imagine. Service-learning, which combines classwork with volunteer work...
or other formal community engagement, builds real-world experience. On-campus jobs can teach (and validate) responsibility while being accessible to even the busiest full-time students. Students who study abroad must develop new relationships and learn self-reliance — both valuable on-the-job skills.

Kaylor said students involved in clubs and organizations learn to lead and handle complex interpersonal relationships, and those who join student professional organizations are exposed to potential mentors and employers.

But whatever experiences students are having in the classroom and beyond, they have to be able to articulate the skills they have learned when they sit down for that first interview.

“We have to teach them how to tell their story,” Kaylor said. “They don’t know how to frame it.”

**EXPERTS SAY THESE SKILLS INDEED PAY THE BILLS**

The headlines are stark:


While college graduates have the skills taught in the major, employers say, they can’t always communicate effectively, solve problems or work in teams.

After hearing the same thing anecdotally, Boise State officials set out to know for sure what was happening in Idaho. They reached out to the premier expert on the topic in the country, Dr. Phil Gardner,

The **NINE BASIC SKILLS** critical to employability

These are the skills identified by the Boise State Career Center and employment expert Dr. Phil Gardner after extensive survey work in Idaho and beyond:

- Analyze, Evaluate and Interpret Information
- Build and Sustain Working Professional Relationships
- Contribute to a Team
- Effectively Communicate Orally
- Manage Time and Priorities
- Perform with Integrity
- Solve Problems
- Take the Initiative
- Think Critically

Brian Tuttle and Ryan Woodings run Metageek, a key player in plans to double the number of Boise State’s computer science graduates.
director of the Collegiate Employment Research Institute at Michigan State University.

Gardner’s survey of employers prompted Kaylor to redefine and reimagine how the Career Center spoke to Boise State students about their future careers.

“There are a set of skills that you need to be successful,” she said. “We know what those skills are and that they cross majors.”

Gardner again came to Boise this past fall for the first-ever “Treasure Valley Skills Summit,” designed to bring academic, business and government leaders together to find the best ways for the university to meet the needs of local employers.

Unfortunately, Gardner said, there is no “silver bullet” skill for success.

“They come in bundles. They have to be developed and integrated together.”

And building these skills isn’t as easy as just adding another class. “We have to be able to weave whole cloth,” he said.

**TIME TO REIMAGINE CAREER READINESS ON CAMPUS**

The tipping point for Boise State President Dr. Bob Kustra was a study released last year by the New York Federal Reserve. It showed that many of today’s college graduates were accepting low-wage or part-time jobs for which they were overqualified. He started speaking regularly on the question of career readiness with Rudin and Dr. Martin Schimpf, provost and vice president for academic affairs.

“Too many of our graduates are realizing that the world they are entering is a very different place from the all-too-often solo experience of university studies,” Kustra said. “The world of work is not defined by disciplines.”

The topic became the focus of his State of the University Address in the fall, and shaped how Boise State launched its groundbreaking College of Innovation and Design — a university-wide hub focused on transforming academic programming, learning and research.

“We need to rethink how we validate a student’s education. Employers need to know more than just what a student majored in, and students need experiences that range freely across the disciplines to fully prepare them for careers and life,” Kustra said.

The college is designed to help faculty work across disciplines to both train students for the modern economy and respond to the real-world needs of industry — problems that rarely can be tackled within a single disciplinary silo.

One of the new college’s first goals will be to launch the “Bridge to Career” program. It will augment traditional majors with condensed learning modules that serve as “finishing” experiences and provide Boise State students with a competitive edge in business and technology.

Students in a science major may learn basic accounting, for example, or get a taste of business management. Those who go through these experiences will earn “badges” indicating to employers that they have gained new skills and competencies and better understand how to apply those skills in the workplace.

“Incoming students have to prepare for jobs that may not even exist when they start their freshman year,” Kustra said.

“We know we have to work with business and industry leaders in our community and region to ensure our graduates have the skills they need to flourish in the modern economy. This is why our College of Innovation and Design is so valuable and so important for our future.”
Michal Temkin Martinez is a collector. But her acquisitions don’t fill up galleries, and you won’t find them tucked into boxes or stacked on a shelf. She collects language.

Dr. Temkin Martinez is director of the Mary Ellen Ryder Linguistics Laboratory at Boise State and an assistant professor of English. The lab is named for the former director of the linguistics program who died in a fire in 2008.

As a linguist, Temkin Martinez is trained in experimental and theoretical phonology, or how sounds are organized within a language.

“There is a misconception that linguists are the Grammar Police, but we aren’t,” she said. “We care about what people are doing with the language, but we don’t say you are doing it wrong. Language is a living thing, and we describe what we hear people doing and look at how they might be ‘breaking the rules’ of that language as it evolves.”

Temkin Martinez gives people clues to words or sentences she wants them to say, then documents how they say it. Their answers provide insight into how a language is being used by native speakers.

She works with colleagues Jon Dayley and Tim Thornes, along with community members and linguistics students who are taking the linguistics capstone course that immerses them in language documentation.

Prior to coming to Boise State University in 2009, Temkin-Martinez’s work was heavily focused on the Hebrew language (she grew up in Israel). With student Ivana Müllner, she currently is sifting through data collected during a linguistic experiment in Israel in 2012.

But with so few Hebrew speakers in the Treasure Valley, she also has turned to the local refugee community to discover the greatest linguistic needs.

This led to collaboration with Boise’s growing African refugee community and creation of the Boise Language Project — a big-picture project that integrates teaching with research and service. Students learn about language documentation and refugee issues, while conducting research that helps the
Boise refugee community.

Documenting African languages includes creation of the first-ever Somali Chizigula-English dictionary. Chizigula is one of a handful of languages spoken by Somali refugees living in Boise and includes sounds foreign to many Americans.

In her capstone course, native speakers are asked to describe objects or tasks in their native languages, and the students’ job is to figure out how the language works, from its sound inventory to how words and sentences are formed. Information gathered could include how to make simple plurals, how a sentence is phrased in past tense, or how verbs and nouns change according to class and gender.

Words are transcribed using the International Phonetic Alphabet. Later, students develop a practical orthography and begin to compile vocabulary and grammatical features of the language to help preserve it. Once the one-semester course is over, larger documentation projects are decided upon with the help of community leadership. The Somali Chizigula-English dictionary is the first large-scale project and is expected to be published this spring.

“It’s not just for refugees who are native Somali Chizigula speakers, it’s also a way to preserve the language and culture,” Temkin Martinez said. “It will include a description of sounds, words and sentences that will help preserve other information about the language and the people’s traditions.”

That preservation is a key motivation for her work.

Somali Bantu consultant Mwaliko Mberwa uses a mask to record airflow as he pronounces traditional Chizigula words. The language has a unique set of sounds involving a combination of airflow from the nose and mouth.

Because there is such a strong link between language and culture, losing a language can literally erase hundreds of years of culture and tradition.

“Research shows that about three of the world’s languages die every year when the last speaker passes away,” Temkin Martinez said.

To prevent that from happening with Somali Chizigula, Temkin Martinez has worked with many members of the local Somali Bantu community as language experts on the project. As they learn more about linguistics, they are able to talk to their community about preserving their language.

While the dictionary is nearing completion, Temkin Martinez and her colleagues have several other projects underway. These include creation of a book of stories for children in the Maay language, a book of proverbs in the KiBembe language from the Democratic Republic of Congo, and a yet-to-be defined project with Tshiluba speakers, also from the DRC.

“This is a great opportunity to train our student linguists in field methods and have a product to give back to the refugee community,” Temkin Martinez said.
SCULPTING A CREATIVE VISION FOR THE ARTS

By KATHLEEN TUCK

His bronze and marble statues dot sites around the country, each one honoring a historical figure, war hero, firefighter or other worthy individual. Now, the clay versions of many of those works are displayed in his studio and gallery on the Boise State campus — the only place in the country where you can see them all together.

Benjamin Victor’s 9-foot bronze statue of Steve Appleton, a Boise State alumnus and former CEO of Micron Technology, was recently installed in the courtyard on the east side of the university’s Micron Business and Economics Building.

And while the Boise State artist in residence and professor of the practice continues to create new works from his 7,500-square-foot studio space in the former Mechanical Technology Building, he’s now helping shape something even bigger — a stronger sculpture program in the university’s Department of Art.

Working with program head Francis Fox, Victor is helping to shine the spotlight on the university’s sculpture program and shatter the stereotype that art is an impractical career choice.

“That’s not true,” Victor said. “Every facet of society uses arts to highlight things about their business or area of expertise. That’s what’s really exciting for the community, our students and their parents. Economic development is a huge component of the arts.”

Fox has taken several students to tour Victor’s studio, where they benefit from viewing the sculptor’s technique in various works. But it’s the professional outreach the two are crafting that Fox finds most exciting.

“It’s a symbiotic relationship where students benefit from internships, skill building and attracting the attention of other artists to the university,” he said.

Fox is passionate about art, and even more so about sculpture.

“I love how sculpture can physically draw you in and then expand your thoughts beyond what is actually there,” he said. “One of my favorite quotes comes from art critic Peter Schjeldahl: ‘Sculpture’s prerogative is to confront us with the fact of our material, physical, bodily reality, making that fact available to thought and feeling — and making it sociable, an open secret shared with others in a common space.’”

Fox sees sculpture entering a renaissance phase, as virtual space and physical space intersect in the digital age. “New equipment is allowing us to grab a slice of life, much like what happened with painting in the wake of photography,” he said, noting that 3D printing techniques are providing sculptors with previously unimagined options.

Boise State students get a taste of his vision through a variety of materials and sculptural processes, including woodworking, metal fabrication, mixed media projects,
foundry and non-metal casting, carving and modeling in a range of materials, and the growing field of digital processes.

The program also boasts access to technology including Next Engine scanners and 3D printers, and to an on-campus metal casting foundry for pouring bronze and aluminum.

Victor would like to see that foundry used to pour one of his own bronze sculptures, giving students a chance to create a professional large-scale sculpture while also providing funds for new equipment. The project would be the perfect marriage of the arts and real-world experience.

And Victor sees other good things ahead as the university continues to grow and expand. He’s especially intrigued by the enthusiasm of Bronco Nation and believes it’s a passion that can be harnessed.

“People are interested in the arts and they’re excited about what we are doing here,” he said. “We want people to be as passionate about the arts as they are about the sports on campus. We’re just scratching the surface of what we can do here, and I want to be part of that.”

www.benjaminvictor.com
art.boisestate.edu
Professor applies time-tested philosophies of economics and social sciences to the concept of commitment

Dr. Heidi Reeder’s academic expertise has centered on relationships between women and men at work, in friendship and in romance. Reeder has studied how and why people commit to one another.

In her new book, “Commit to Win: How to Harness the Four Elements of Commitment to Reach Your Goals,” she starts with those questions, expands beyond human relationships and offers a plan of action.

“The book broadened to ask why we commit in general. What does commitment give us, and why does it sometimes inspire an averse reaction?” said Reeder, an associate professor in the Department of Communication.

The book distills commitment into four elements: treasures, the benefit one gets from working toward a goal; troubles, the difficulties one encounters; contributions, one’s investment of resources; and finally choices, one’s profusion or lack of paths.

Reeder is quick to say that these ideas are not new. Researchers in economics, sociology and other disciplines have studied them for decades. Her mission with this book, she said, is to take those time-tested studies and “humanize them and apply them” to bring them out of the shadows and into real life.

Reeder is an academic grounded in popular culture. She blogs for Psychology Today. She has worked on film projects, given a TEDx Talk, and co-written a theatrical piece about women in science.

“Commit to Win” also straddles both worlds. The book’s “action pages” offer a practical takeaway that one reviewer said was worth the price of the book alone.
Reeder details strategies for deepening commitments to work, ambitions and people. But just as key are questions to help readers know when a commitment should end.

Reeder is using the book in her class, Commitment and Communication. It’s guiding students as they create podcasts, a blog series or a workbook for populations that would benefit from commitment skills, such as high school students transitioning to college, or competitive athletes.

Kacey Kretzler, a senior majoring in communication, is part of a team creating a public service announcement and brochure for families of veterans who have returned from war with post-traumatic stress disorder. Here, commitment means family members “committing to themselves, going through the mental processes of keeping calm, and getting help,” said Kretzler.

“This book is seriously amazing, the way it breaks commitment down into what’s almost a mathematical formula,” said Kretzler.

The book is so provocative that class time ends before the conversations among students do, she said.

“There’s so much we all want to say and understand.”

Hope for the Dammed: The U.S. Army Corps of Engineers and the Greening of the Mississippi
By Todd Shallat

While the title of his new book includes the word “dammed,” it could just as easily be “damned,” said Dr. Todd Shallat, a professor of history.

He wrote this collection of essays as a visiting scholar with the U.S. Mississippi River Commission from 1996 to 2000. The commission expected Shallat to confirm that its overseer, the U.S. Army Corps of Engineers, “had taken green engineering to heart” in response to the National Environmental Policy Act of 1970.

Shallat found that the picture in Mississippi was more complicated. While the Corps had made some progress in areas like protections of fish and local ecosystems, it was still beholden to Congress and a myriad of special interests whose aims were not always green.

Shallat wrote a report and created a web page with his findings. The Corps removed content it considered controversial — an action Shallat isn’t shy about calling censorship.

His essays found audiences elsewhere. This year, the nonprofit American Public Works Association collected three of them — “In the Wake of Hurricane Betty,” “Lessons of the Levees,” and “Storm over Alton” — in “Hope for the Dammed.” The book is volume 33 in the association’s annual series.

“The Corps on the Mississippi, these essays maintain, is Sybil with a thousand faces,” said Shallat. “Its environmentalism is a plastic agenda suspended between the dam-it, ditch-it tradition and nostalgia for vanishing landscapes.”

Shallat directs Boise State’s Center for Idaho History and Politics. He has written popular volumes on local history.
It’s normal for practitioners of a new field of study to want to find their own road, to first see their discipline as separate and unique from others, said Dr. Anthony Walsh, a professor of criminal justice.

But eventually, he said, that new field of study must find and make peace with its relationship to the sciences that came before, as chemistry did with physics, biology with chemistry, and psychology with biology.

In his new book, Walsh echoes the point made by a former president of the American Sociological Association that sociologists have allowed the fact that we are social beings to obscure the biological foundations on which behavior ultimately rests. Sociology, said Walsh, has much to gain by embracing the nuts and bolts of the human brain, genome and evolutionary history revealed by the natural sciences.

Sociology, the study of society and people within that framework, emerged as a social science in the late 19th century. At that time, concepts like a person’s genetic makeup and its effects on human behavior were not familiar in the social sciences, said Walsh. “But now, we know enough to make those connections, and they are being made all the time.”

“Biosociology” looks at sociological realms — crime, social class, intelligence, the family, gender and culture — through their connection to biology. The book is related to Walsh’s past work, “The Science of Love,” which seeks the biological underpinnings of what many have considered the deepest realms of mystery.
Research Paves the Way to a Healthy Economy

With the sting of the recent recession still fresh on everyone’s minds, building a healthy economy is high on our list of ways to ensure a more stable and profitable future. But what does that mean? I believe it means creating new jobs (including some in areas we haven’t even imagined yet), ensuring that businesses remain successful and vibrant and developing new products that contribute to sustainability and an improved quality of life.

At Boise State, we’re working toward all these goals and more while also strengthening the research and development priorities that are at the heart of a thriving economy.

In this issue of EXPLORE, you’ll read about some of those efforts. For every story told here, there are many dedicated engineers, biomedical researchers, artists, educators, nanotechnologists, health care professionals and others who are dreaming the unimaginable and asking “why not?”

And every scientific or artistic inquiry or out-of-the-box idea that leads to a funded project benefits not only the academic community, but also our local economy. Research and creative activity dollars translate to jobs, purchases and potential commercialization, and patents, licenses and startup companies are the gears that keep our economic engine running.

We’re excited about that. We hope you are, too.

– DR. MARK RUDIN, VICE PRESIDENT FOR RESEARCH and ECONOMIC DEVELOPMENT

In his new book, Dr. Ralph Clare, an assistant professor of English at Boise State, makes the case that depictions of corporations in American fictional works, including novels, films, television and comic strips, are mirrors for economic forces and societal trends.

Fictionalized corporations have become tangible symbols of Americans’ uneasy, sometimes contradictory relationship with capitalism. Corporations represent power and influence, but also can become visible targets in times of discontent.

“The way in which a corporation is represented can tell us much about how these specific anxieties are related to larger economic concerns,” writes Clare.

The breadth of the fictional works and manifestations of “the corporation” included here are dizzying. They range from “The Octopus,” a turn-of-the-century book based on a real-life conflict between California wheat farmers and the railroad, to “Gung Ho,” a film about a Japanese corporation operating an American car plant in a community that has seen brighter days, to “Gain,” a novel about the interwoven lives of massive corporations and real people.

Clare’s final chapter focuses on more works of popular culture: “The Office,” “Then We Came to the End,” and others that portray workers quietly bristling inside monolithic corporations.

Here, Clare writes, “Rage or anger is bypassed for the ennui of Post-It note complaints.”

In the face of massive corporate entities that will strive to make money and persuade people to buy their products until the end of time, Clare posits that humans can retain free will as long as their imaginations “remain focused on conceiving of other possible lives and other possible worlds.”

Fictions Inc: The Corporation in Postmodern Fiction, Film and Popular Culture

By Ralph Clare
Here’s Looking at You, Kid

A bucket of burrowing owls awaits banding and tests to monitor their health. Biology professor Dr. Jim Belthoff worked with eight undergraduate students at the Snake River Birds of Prey National Conservation Area to observe the behaviors of both ground and air predators, along with tagging and measuring the birds they encountered. Students then presented their findings at the Undergraduate Research Conference held at Boise State.