THIS PAGE LEFT INTENTIONALLY BLANK

SUBJECT

Second Reading, Proposed Amendments to Board Policy III.W., Higher Education Research

REFERENCE

June 17, 2010	Board approved a second reading to Board Policy III.W. Higher Education Research
August 11, 2011	Board approved first reading to Board Policy III.W. Higher Education Research

APPLICABLE STATUTE, RULE, OR POLICY

Idaho State Board of Education Governing Policies and Procedures, Section III.W., Higher Education Research Council Policy

BACKGROUND/DISCUSSION

The Board's Higher Education Research Policy, III.W., is intended to recognize Idaho's universities role as a driving force in innovation, economic development, and enhanced quality of life for Idaho. By developing and leveraging the State's unique research expertise and strengths, Idaho's universities will serve as catalyst and engine to spur the creation of new knowledge, technologies, products and industries. This in turn will lead to new advances and opportunities for economic growth and enhance the Idaho's reputation as a national and international leader in excellence and innovation.

The Higher Education Research Council (HERC) of the Idaho State Board of Education is responsible for advising the Board on the implementation of strategies that increase the quality and quantity of research in Idaho, encourage continued public and private support of research, enhance the quality and quantity of academic research produced, increase faculty eligible to compete for research funds, where appropriate, development of Idaho public institutions' research infrastructure and the development and implementation of a higher education statewide strategic plan for research.

At the August 2011 Board meeting the Board approved a first reading of amendments to Board policy III.W. Changes included a restructuring of the HERC committee members, designation of the Vice Presidents of Research as the Chairs, to serve on a rotating basis and the inclusion of a nomination process for new members.

There have been no changes between the first and second reading.

IMPACT

Approval of the amendments to Board policy III.W. will provide HERC with the structure needed to effectively address policy and programs consistent with the current climate of academic research in the Idaho.

ATTACHMENTS

STAFF COMMENTS AND RECOMMENDATIONS

The proposed changes will allow HERC to be more responsive and focus on Higher Education Research issues that affect our public postsecondary institutions system wide.

Board staff recommends approval of proposed amendments to Board Policy III.W. Higher Education Research as presented.

BOARD ACTION

I move to approve the second reading of Board Policy III.W., Higher Education Research to include the restructure of Higher Education Research Council and the inclusion of a member selection process as submitted.

Moved by_____ Seconded by_____ Carried Yes_____ No_____

1. Higher Education Research Council

   a. Purpose and Coverage

      Idaho's universities seek to be a driving force in innovation, economic development and enhanced quality of life in the State of Idaho through nationally and internationally lauded research programs in strategic areas. By developing and leveraging the State's unique research expertise and strengths, Idaho's universities will serve as catalyst and engine to spur the creation of new knowledge, technologies, products and industries. This in turn will lead to new advances and opportunities for economic growth and enhance the State's reputation as a national and international leader in excellence and innovation.

      The Higher Education Research Council of the Idaho State Board of Education (HERC) provides guidance to Boise State University, Idaho State University, Lewis-Clark State College and the University of Idaho for a statewide collaborative effort to accomplish these goals and objectives. In addition, HERC provides direction for and oversees the use of the limited resources of the State of Idaho provided by the Legislature for research by promoting research activities that will have the greatest beneficial effect on the quality of education and the economy of the State. The implementation of the higher education research policy of the Board will be the duty and responsibility of HERC. HERC shall report annually to the Board on a schedule and in a format established by the Executive Director.

   b. The Role of Research in Higher Education

      Research is the creative search for and application of new knowledge.

      i. Philosophical Statements and Guiding Principles

         The significant role science, technology and other research play in statewide economic development is also accompanied by a demand for the scrutiny of publicly funded research, accountability, and attention to the management of ethical, legal, and safety issues associated with academic research. To fulfill this role, HERC will direct and oversee the development, implementation, and monitoring of a statewide strategic plan for research. The development of a statewide strategic plan for research that will assist in the identification of general research areas that will enhance the economy of Idaho via partnering between academia, industry, and/or government. HERC will facilitate this partnering and interaction among business, industry and the public sector with science, engineering and other research faculty.

This Policy is designed to assist the public baccalaureate and post-baccalaureate institutions in addressing these areas via appropriate research activities through:

1) individual and multi-disciplinary research projects;
2) extensive and rapid dissemination of the new knowledge and establishment of knowledge networks which would facilitate public, private, and academic institution interaction; and
3) collaborative relationships between academia and varied shareholders outside the academy.

The guiding principles are:

1) to maximize impact on the quality of education and economic development as a consequence of Idaho's investment in quality science, engineering, and other research.
2) to ensure accountability for the state's investment via demonstrable results.

ii. Support of research activities with public funds is important because:

1) Research is important in the education of students at all levels.
2) Research plays an important role in maintaining and enhancing faculty quality.
3) Academic research contributes to economic development.

iii. The Board desires to increase the quality and quantity of research and to encourage continued public and private support of research in Idaho through application of the following principles:

The quality and quantity of academic research produced is extremely dependent upon the research infrastructure.
Faculty at Idaho's baccalaureate and post-baccalaureate institutions will be eligible to compete for research funds.

iv. The development and implementation of a statewide strategic plan for research is a vehicle for identification of research objectives and areas.

c. Specific Funding Programs to Strengthen Research in Idaho

The Board recognizes that talent exists on all of the campuses and the importance of permitting competition for research support and initiation funds. Therefore, the Board will use the following criteria in allocating funds for research activities under this policy at the various institutions.

Additionally, any condition set forth in the legislative appropriation for these research programs must be demonstrably met by the programs and/or projects that are to receive the appropriation.

i. Infrastructure

A portion of the competitive research funding should be distributed to the state's baccalaureate and post-baccalaureate institutions to support their science, engineering, and other research infrastructure. Distribution of these funds will be made according to guidelines approved by HERC. These funds should be reserved for library support essential to research, graduate research assistantships, post doctoral fellows, technician support, maintenance contracts, research equipment, competitively awarded summer research support, startup funds for new hires, and incentives to reward faculty for their research achievements.

ii. Targeted Research Funding

Faculty members at the state's baccalaureate and post-baccalaureate institutions will have an opportunity to submit research project proposals for review under this program.

1) All projects selected for funding under this program will demonstrate the potential for economic benefit or cost savings for the State.
2) A major focus under this program should be start-up and seed funds that will assist a principal investigator in promoting basic or applied research; competing for external funding; and enhancing technology transfer or commercialization.
3) Collaborative research projects are encouraged.

Guidelines for this program will be established by HERC, will incorporate an independent peer review, and will include an evaluation component for commercial applicability for the benefit of the State.

iii. Research Centers

Many important research advances are made through focused research centers. These centers should involve several faculty members from multiple institutions in conjunction with the necessary research equipment and support personnel. The funds needed to establish centers of this type should be adequate to create a critical research mass for multiple years leading to research center sustainability. State funding should be supplemented by non-state matching funds.

iv. State Matching Awards

Under this program State funds would be available to match those awarded by non-state sources by using an external peer review process.

Examples of matching entities for the state matching funds would be:

1) Federal Agencies
2) EPSCoR projects e.g., National Science Foundation, National Institute of Health, Department of Energy, Department of Defense, National Aeronautics and Space Administration, etc.
3) Foundations
4) Business and Industry
5) Other

v. Post-Award Accountability

Any project receiving funding through any of the previously described Board sponsored programs will be required to report on its productivity with respect to such items as:

1) number of students involved;
2) number of faculty involved;
3) external funding earned as a result;
4) publications in refereed journals;
5) presentations at professional meetings and conferences;
6) patents awarded or pending;
7) economic benefits; or
8) problem resolution.

Reporting procedures will be established and administered through HERC.

d. Responsibilities and Membership of the Higher Education Research Council

In order to advise the Idaho State Board of Education on the implementation of the above strategies, HERC will report to the Board through the Instruction, Research and Student Affairs Committee. The assigned responsibilities of HERC will include the following:

i. direct and oversee the development of a higher education statewide strategic plan for research;
ii. direct and oversee the use of Legislatively appropriated funds for higher education research;
iii. determine and distribute to all interested parties the guidelines for submission of proposals under the competitive programs;
iv. organize the review procedures for proposals submitted under the guidelines mandated and recommend to the Board which of these proposals should be funded;
v. monitor the productivity of each funded project to warrant continued funding and to provide accountability.

The membership of HERC shall consist of:

i. the Vice Presidents of Research from Boise State University, Idaho State University, and the University of Idaho and a representative of Lewis-Clark State College;
ii. a representative of the Idaho National Laboratory (INL); and
iii. three non-institutional representatives, with consideration of geographic, private industry involvement and other representation characteristics.

The Board shall appoint the three non-institutional representatives. The three non-institutional representatives shall be appointed for terms that are initially staggered to provide a rolling renewal of appointments. Thereafter, appointments shall be for three years. The appointments of the representative of INL shall be subject to approval of the Board. All members of HERC shall have equal voting privileges.

One (1) of the Vice Presidents of Research shall serve as chair of the Council, with a new chair selected each academic year such that the chair shall rotate among the Vice Presidents of Research. No Vice President of Research shall serve more than three (3) consecutive terms.

Executive Committee:
The Executive Committee shall consist of the three Vice Presidents of Research.

e. Nominating Process

HERC shall nominate candidates for membership for Board consideration. The list of candidates, including letters of interest and biographical information, must be forwarded to the Board for consideration not less than 60 days prior to expiration of the term of a committee member, or within 30 days after any vacancy.

i. Incumbent Reappointment

If the incumbent candidate is interested in reappointment and is eligible to continue serving based on HERC's current membership structure, the incumbent will provide in writing his or her interest for reappointment, which will be forwarded to the Board for consideration.

ii. Open Appointment

1) HERC members shall solicit nominations with consideration given to geographic, private industry involvement, and other representation characteristics.

2) Each nominee must provide a written statement expressing his or her interest in becoming a member of HERC. Each nominee must also

provide a description of his or her qualifications, and must identify his or her primary residence.

3) HERC will review all nominations for the vacant position and will forward the qualified candidates with recommendations to the Board for consideration.

The Board may, after a review of nominee's pursuant to the process described herein, consider other candidates for HERC membership identified by the Board or its staff.

2. Experimental Program to Stimulate Competitive Research (EPSCoR)

a. Overview

The Experimental Program to Stimulate Competitive Research (EPSCoR) represents a federal-state partnership to enhance the science and engineering research, education, and technology capabilities of states that traditionally have received smaller amounts of federal research and development funds. As a participating state, Idaho EPSCoR shall be subject to federal program requirements and policy established by the Idaho State Board of Education (Board). The purpose of EPSCoR is to build a high-quality, academic research base to advance science, technology, engineering and mathematics (STEM) to stimulate sustainable improvements in research and development capacity and competitiveness.

b. EPSCoR Mission

Idaho EPSCoR's mission shall be to stimulate systematic and sustainable improvements in Idaho's academic science, technology, engineering and mathematics (STEM) research capabilities for the purpose of establishing nationally prominent research competitiveness in selected areas eligible for support by the National Science Foundation and other federal and private sponsors. It is expected that EPSCoR investments shall harmonize with the research interests of Idaho's public universities, the State of Idaho, and Idaho's industries. The University of Idaho, Idaho State University and Boise State University are Idaho EPSCoR partner institutions.

c. Idaho EPSCoR Committee

Idaho EPSCoR shall be guided by a committee appointed by the Board.

i. Duties and Responsibilities

The Idaho EPSCoR Committee shall serve under the direction of the Board and shall oversee the implementation of the Idaho EPSCoR program and office. The Idaho EPSCoR Committee is responsible for the selection and progress of EPSCoR projects funded by various federal agencies, in

accordance with agency-specific guidelines. The committee shall establish policies and procedures to ensure that EPSCoR program goals and objectives are met. These policies and procedures shall be brought to the Board for approval. The committee will carry out the following EPSCoR objectives:

1) To catalyze key research themes and related activities within and among EPSCoR jurisdictions that empower knowledge generation, dissemination and application;
2) To activate effective jurisdictional and regional collaborations among academic, government and private sector stakeholders that advance scientific research, promote innovation and provide multiple societal benefits;
3) To broaden participation in science and engineering by institutions, organizations and people within and among EPSCoR jurisdictions; and
4) To use EPSCoR for development, implementation and evaluation of future programmatic experiments that motivates positive change and progression.

ii. Operating Procedures

The committee will meet in person annually, and more often by teleconference to fulfill its duties. Additional meetings may be called by the chair or by request of three (3) or more committee members. The chair will appoint subcommittees as needed. The appointments are subject to review of the entire committee. On a regular basis, the committee shall monitor the activities of the project director and provide direction as necessary.

The project director, under the direction of the chair, prepares the agenda, schedules each meeting of the committee and maintains a written record of the committee's activities.

iii. Membership

Committee membership shall be constituted to provide for geographic, academic, business and state governmental representation. The committee shall consist of sixteen (16) members with voting privileges, composed of the following:

1) The Vice President for Research or Chief Research Officer at the University of Idaho, Idaho State University, and Boise State University;
2) One member from each chamber of the Idaho state legislature;
3) One representative from Idaho National Laboratory;
4) One representative from the Idaho Department of Commerce – such individual shall be focused on economic development;
5) The remainder shall be representatives of the private sector who have a stake in developing the state's research infrastructure or who have experience in innovation and entrepreneurial activities, applied research

and development, management and finance, or community economic development.

In addition, one representative of the Governor's office and one member of the Board shall serve on the committee as ex officio members without voting rights.

iv. Nominating Process

The Idaho EPSCoR Committee will nominate candidates for committee membership for consideration by the Board. The list of candidates must be forwarded to the Board for consideration not less than 60 days prior to expiration of the term of committee member, or within 30 days after any vacancy.

1) Incumbent Reappointment
In the event that the incumbent candidate is interested in reappointment and is eligible to continue serving, the nominating committee shall forward a recommendation to the Board, along with a letter of interest and statement of qualifications for the incumbent. The Board may choose to reappoint the incumbent without soliciting other candidates, thus completing the appointment procedures. If there is no incumbent seeking reappointment, or if the Board chooses not to reappoint an incumbent, the procedures are as outlined in item (2).

2) Open Appointment
   a) The EPSCoR committee on behalf of the Board will advertise the vacancy in appropriate state, regional or local publications. Such advertisements will solicit interested persons to apply for the vacant position on the Idaho EPSCoR Committee.
   b) Each applicant must provide a written statement expressing his or her interest in becoming a member of the committee. Each applicant must also provide evidence of his or her qualifications, and must identify his or her primary residence.
   c) The EPSCoR committee will review all applications for the vacant position and conduct interviews as deemed necessary. The purpose of this review is to identify the most qualified candidates for Board consideration.
   d) The EPSCoR committee will forward the qualified candidates, in order of preference, to the Board for consideration. The Board may provide for interviews of the candidates, if needed.

The Board may, after review of the candidates nominated by the committee pursuant to the process described herein, consider other candidates for committee membership identified by the Board or its staff.

v. Terms of Membership

Committee members shall serve five-year terms. An incumbent member may be nominated by the committee for re-appointment by the Board, but no member may serve more than three (3) consecutive terms. All terms, regardless of length, shall begin on July 1st and end on June 30th of the year(s) beginning or ending said term.

Appointments will be staggered to ensure that no more than one-third (1/3) of the appointments will become vacant in any given year. An appointee who has reached the end of his or her term shall remain in service as a committee member until reappointment, or until the appointment of a new member is named and approved by the Board. Officers will be nominated and elected by a vote of the committee.

d. Reporting

The committee shall prepare an annual report to the Board that details all projects by federal agency source, including reports of project progress from associated external Project Advisory Board (PAB).

e. Idaho EPSCoR Office

Within guidelines specified by NSF and this policy, the EPSCoR committee shall determine and select an Idaho EPSCoR partner institution to serve as the lead institution which will house the project director for purposes of administering Idaho EPSCoR and providing support and resources to the Idaho EPSCoR Committee.

f. Idaho EPSCoR Project Leadership

The project director and any associate project directors are selected by and serve under the direction of the Idaho EPSCoR Committee.

The project director shall be a tenured faculty member of an Idaho EPSCoR partner institution whose qualifications must include: a successful research track record (grants and professional publications) in science or engineering, experience in research management and academic administration, and a successful record of dealing with various segments of academic institutions, government, industry, and the public.

THIS PAGE LEFT INTENTIONALLY BLANK

SUBJECT

Value of Research to Postsecondary Education

REFERENCE

May 2011	Board discussed the necessity of determining the impact of three research institutions on the statewide education system.

BACKGROUND/DISCUSSION

This report is in response to the request made at the May Board retreat to describe and document the impact of the research function at each of the three universities in Idaho. The report was to document the value of the research to the institution and the state as well as the costs associated with maintaining a research function. The original request was made by President Westerberg during the May retreat with concurrence from the remainder of the Board. A formal Board motion was not made. Board Member Edmunds was asked to facilitate the report generation. The Vice Presidents of Research (VPR) from Boise State University, Idaho State University and the University of Idaho were tasked with creating the report. After some conversations about the scope of the report, a format was agreed upon. The report was to document the value research adds to or takes away from an institution's core mission to produce degrees and an educated citizenry, and to include quantifiable data supporting the information provided.

IMPACT

The attached report provides information on the value of research at the universities. It will assist the Board in thinking about the role research should play in the development of institutional roles and missions.

ATTACHMENTS

STAFF COMMENTS AND RECOMMENDATIONS

The Board identified research as being one of the priority areas for the Board in the coming year during the May 2011 Board retreat. Additionally, in past years there have been ongoing discussions regarding the impact of three research institutions on the statewide educational system, the cost to run three research institutions and the relative need, given the state's demographics, of having three research institutions. An institution's mission statement and program offerings are impacted by their research vision for the future. The Board will be approving the institutions' Role and Mission Statements in February as well as additional graduate level program approval requests in future meetings.

The Board should use the information presented to inform their decision making about institutional roles and missions as well as decisions about future graduate degrees.

BOARD ACTION

This item is for informational purposes only. Any action will be at the Board's discretion.

THE VALUE OF RESEARCH IN IDAHO HIGHER EDUCATION
A report prepared by Boise State University, Idaho State University and the University of Idaho

Idaho's universities are deeply embedded in the life, economy and culture of the state they serve. Conducting research enhances the universities' core mission of educating undergraduate students by generating a wealth of opportunities, supporting classroom instruction, encouraging retention, creating a culture of excellence, attracting and retaining top talent in our state and strengthening Idaho's economy. This paper explores some of the many ways that the research enterprises at Idaho universities benefit students, and as part of an upward spiral of opportunity, our state as a whole.

Students: A Stronger Education, A Brighter Future

An important role of research is to provide a strong scholarly base for educational programs. This model also upholds the original intention that American universities were established with the idea that teaching should be informed by scholarship and research.

A landmark 2007 report from the Boyer Commission notes that a research university's "ability to create such an integrated education will produce a particular kind of individual, one equipped with a spirit of inquiry and a zest for problem solving; one possessed of the skill in communication that is the hallmark of clear thinking as well as mastery of language; one informed by a rich and diverse experience. It is that kind of individual that will provide the scientific, technological, academic, political, and creative leadership for the next century. "

As Idaho strives to educate its next generation of leaders, the integrated education model referred to in the Boyer report is of increasing relevance. Teaching and research are inseparable components in the learning environments of Idaho's universities, creating a culture of inquiry, and providing experiences for students that form the bedrock of future careers and a lifetime of success.

Students work alongside faculty on funded research projects and in the process develop relationships with mentors that build confidence and support learning. As part of research teams facilitated by talented faculty, students learn from each other and develop skills in leadership and collaboration that prepare them for challenging careers. Research enhances classroom learning by providing opportunities for students to "use" what they learn in hands-on settings, thus making abstract concepts more accessible and helping students understand their relevance to address real world issues and challenges.

Conducting research encourages students to stay in college and complete their educations, and thus is a supporting factor in reaching the State Board of Education's 60 percent goal – that 60 percent of Idahoans age 25-34 will have a degree or certificate of value by the year 2020. Financial issues, a sense of isolation, and a lack of motivation are consistently identified in surveys as among primary reasons students drop out– all issues that student research addresses. Research grants fund student salaries that help pay tuition and living costs, and research groups provide a sense of camaraderie and shared purpose. During FY 2010, 35 percent of the total amount of student salaries at Idaho's universities were paid from federal and state research awards and other sponsored projects– more than $12.4 million. The overall number of students who received salaries from sponsored projects funding was 2,086.

A study from Boise State provides more evidence of the positive relationship between student research and student retention: The College of Engineering placed 37 freshman and sophomore students in college research programs. The one-year retention rate for these students was 100 percent – well above the overall retention rate for sophomore and freshmen classes.

Professor M. Powell at the University of Idaho Aquaculture Research Institute in Hagerman worked with two high school teachers at Filer High School in 2004 to develop a biotechnology course for juniors and seniors using genetic sequencing equipment donated by the university. Part of the course was the genetic sequencing of fish samples for Idaho Department of Fish and Game and Idaho Power. In addition, 13 juniors and seniors have done semester long projects with Powell at the Hagerman facility. All 13 students have gone on to study at universities.

For the past two years, Idaho State University has operated the Career Path Internship Program. The purpose of this program is to provide opportunities for the University to employ students on campus in positions concomitant with their academic and professional interests. First year data shows that 84% of those involved in the CPI program returned to the universities the next year (9% graduated).

Each year undergraduate and graduate students give research presentations at regional, national and international conferences, invaluable experiences that build confidence, lead to new professional contacts and broaden perspectives of the world. Idaho students publish their research findings in prestigious academic journals, an indication of the rigor and relevance of their research. It is particularly impressive that *undergraduate* students are authors, something unheard of at many state universities where only graduate students conduct research that leads to publication.

Idaho students are listed as inventors on patents awarded to their respective universities by the U.S. Patent Office. As active participants in the development of intellectual property, students gain an understanding and passion for innovation, the steps involved in patent acquisition and how to present complicated material in way that underscores its potential and relevance.

Students actively engaged in conducting research gain experience and expertise that increases their competitiveness for high-paying jobs after graduation. In 2010, Idahoans working in the high-tech sector earned an average $71,216 – more than overall salary average of $34,904, according to the Idaho Department of Labor. Through research internships and research collaborations with public and private sector partners, students have many opportunities to interact with potential employers, develop contacts and hone skills that enhance their competitiveness for these sought-after jobs.

New graduates entering industry bring knowledge of recent scientific research and an ability to solve complex problems, perform research and develop ideas. At the same time, the skills gained by conducting research are highly transferable, since at their core they involve the ability to communicate clearly, to tackle complex challenges, learn new protocols and to collaborate effectively. In today's increasingly competitive market, such skills strengthen a prospective employee's opportunities for obtaining a rewarding job.

In addition to undergraduate education, research conducted at Idaho universities is integral to the coursework and success of graduate students, many of whom receive external support for master's and Ph.D. programs through research fellowships awarded as part of federal grants. The U.S. Bureau of Labor and Statistics projects jobs that typically require a master's or doctoral degree are likely to increase 17-18 percent between 2008 and 2018, with a projected

estimate of 2.5 million jobs, underlying the importance of graduate education in a number of fields of study.

Faculty and Institutions: Leveraging Strengths

Faculty members who conduct research are oftentimes at the cutting edge of their fields. They bring this knowledge to their teaching, research labs and interactions with students and colleagues, raising the standards of scholarly work and education beyond their disciplines to create a "rising tide" of university excellence that advances the entire institution, regardless of field of study. In a setting in which inquiry is prized, many courses now provide opportunities for students to succeed through discovery-based methods. Idaho universities encourage teacher/scholar/researchers who discover, create, apply, and transmit insights about subjects in which they are the experts.

Research and creative activities that are conducted at the highest levels and funded by national public funding bodies, the private sector and international/national private foundations bring global recognition to the faculty and attest to their high levels of achievement in their field. Within this context, senior faculty also participate in leadership roles in their professional societies, lead international and national conferences and meetings, provide peer review through panel service for national funding bodies and editorial leadership of peer reviewed journals. Through these professional networks, senior faculty members generate opportunities for junior faculty in networking and toward funding success. The benefits from these activities also flow on to graduate and undergraduate students and feed back to regional collaborating industries.

Research programs enable Idaho universities to acquire sophisticated scientific instrumentation and other infrastructure paid for through federal grants. This instrumentation expands the scope of research conducted at the university by enabling researchers to tackle increasingly complex challenges that would not otherwise be possible. Businesses and entrepreneurs utilize this instrumentation, as do researchers at top institutions as part of their research programs, providing more opportunities for collaboration.

Research programs also support the efforts Idaho universities to effectively serve their regions and fulfill their missions:

As the state's land-grant university, the University of Idaho was founded with a constitutional charge to conduct scientific research in disciplines related to agriculture and engineering. Contributions by UI and other land grant institutions have had major impacts on the development of agriculture and underpinned the growth of the rest of the U.S. economy. More recently, land-grant impact, including UI's impact, has extended across the sciences, engineering, information technology and other knowledge-based industries. Idaho State University capitalizes on its location in southeastern Idaho to forge collaborations and outreach with public and private sector partners and has specific responsibilities in delivering programs in the health professions, the related biological and physical sciences, and teacher preparation. As Idaho's university located in and serving the greater Boise metropolitan area, Boise State University's research programs are focused on meeting the needs of the region, including preparing its students for jobs today and in the future as the Boise Valley continues to grow. Boise State's research strengths include public policy, materials science, nanoelectronics and several other areas that are aligned with the area's government, business, industry and technology sectors.

Idaho Universities: An Engine for Economic Growth and Prosperity

With technical, professional, and scientific jobs projected by the U.S. Department of Labor & Statistics to be the fastest growing job sector in coming years, developing a strong regional high tech culture can help ensure economic growth. Idaho's universities provide expertise, infrastructure, resources and a trained workforce essential to this effort. Many tens of millions of dollars in federal grants are awarded each year to Idaho's universities, and is new money to Idaho.

Research conducted at Idaho's universities generates new knowledge, inventions and technologies that can be commercialized, expanding Idaho's economy. Through basic research, our universities further understanding about our world that could lead to tomorrow's breakthroughs and help address major social and health concerns. Many of today's hottest products – from the iPod to GPS to flat screen televisions – were invented as the result of basic research.

In FY 10, Idaho universities were awarded 12 patents by the U.S. Patent Office**,** including patents that could lead to applications as diverse as better ways to treat cancer, a vaccine for a previous untreatable fish disease, improved methods for storing hydrogen and smaller and faster computers. Idaho's universities filed 38 invention disclosures and finalized 16 licensing agreements that generated $205,051. This intellectual property is akin to a savings bond for Idaho's future economy, with potential for commercialization that could generate new businesses and expand the tax base in the state,

The research programs of Idaho universities help create a climate of opportunity and progress that attracts creative new minds to our state and region. This in turn stimulates additional knowledge that leads to new enterprises and partnerships that continue to build the knowledge-based economy. A climate of opportunity encourages our brightest students to enroll in Idaho universities and to launch their careers here rather than relocate to other states.

Through research collaborations with the public and private sectors, Idaho universities provide expertise and resources to address issues that impact Idahoans and that strengthen a broad range of organizations. The link between universities and industry is a two-way interaction, with knowledge and informal discussions flowing between them. University R&D encourages industry R&D, and vice versa.

The Council on Competitiveness (2011) notes that universities are being called upon by business and commerce to partner in building mutually beneficial goals " between research and manufacturing - especially manufacturing at scale, improved vocational and STEM education and a commitment to supporting higher education and science." These evolving roles bring new opportunities to regions as it is now widely accepted that "innovation is an interactive process between businesses, universities, and governments," according to a report published in the IEEE Technology and Society Magazine (2001).

At a time when a number of Idaho's neighboring states, including Utah, Washington and Oregon, have implemented comprehensive plans for economic development through investment in higher education and the innovation ecosystem, robust research programs at Idaho universities will help ensure that our state will have resources and programs in place to be able successfully compete in the knowledge-based economy in the years ahead.

Undergraduate Research: Laying a Foundation for Future Success

Many students who conduct research at Idaho universities point to their experiences as a pivotal to their overall education and invaluable to their future successes. Here are some examples.

BEN PARKER, BOISE STATE:
Research experiences "made me more competitive in the job market":

Conducting hands-on research at Boise State laid a foundation of experience and knowledge that was pivotal both in helping Ben Parker figure out the kind of work he'd like to do and gaining employment in his field.

A 2009 graduate of Boise State in chemistry, Parker is currently the R&D and Process manager at BHS Marketing, a Nampa-based company that manufactures specialty chemical products for industrial, water, and food processing. Parker's relationship with BHS began in 2006 as a chemistry student intern. While at Boise State, he also worked with chemistry professor Owen McDougal to characterize fuel briquettes made of biodegradable materials as well as on a collaboration effort with McDougal, professor Henry Charlier, and a private firm, Boise Technology, to develop new chemical decontamination methods.

"It was invaluable," said Parker of the skills and perspective he gained while doing undergraduate research. "It made me more competitive in the job market and deepened my overall education. I found I really enjoyed the problem-solving process. I love being able to apply the things I've learned to create new things, and that's something I've been able to continue to do here at BHS."

HILLARY SWANN, IDAHO STATE UNIVERSITY
Psychology major receives highly competitive grants from international honor society

Psychology major Hillary Swann was recently awarded three research grants for an independent project that examines how direct spinal administration of a serotonin receptor agonist influences locomotor behavior in young rats. Swann's project provides implications for rehabilitation of function in individuals with a spinal cord injury, as well as infants with motor or neurological disorders.

Swann is a recipient of an ISU Undergraduate Research Grant , a Psi Chi Undergraduate Grant and a Psi Chi Summer Research Grant. Psi Chi is the international honor society in psychology, and the Psi Chi grants Swann received were highly competitive at an international level.

Swann wrote all three grant proposals, did pilot research for the project, and is currently working on collecting and analyzing data. She will present her findings at upcoming meetings of the International Society for Developmental Psychobiology and the Idaho INBRE.

Swann plans to graduate with a bachelor's degree in psychology this next year and is applying to graduate programs in psychology and neuroscience. Her goal is to gain an academic position in a university setting so that she can continue to conduct neuroscience research.

INGRID FRUTH, UNIVERSITY OF IDAHO
Love of research leads former INBRE fellow to grad school, NIC professorship

Ingrid Fruth began her college career as a nursing student at Northern Idaho College, when her advisor noticed a sparkle in her eye as she spoke passionately about biomedical research.

"Ingrid learned that she did enjoy the laboratory environment and that she possessed the fine motor skills to succeed," said Rhena Cooper, an NIC microbiology instructor and INBRE coordinator. "She knew that not only did she want to work in a laboratory, but that she wanted to be involved in problem solving investigations. She learned enough to follow her dreams!"

Fruth received an associate degree from NIC and then enrolled at the University of Idaho, where she earned a bachelor's degree in microbiology in 2005 and a Ph.D. in 2009. Fruth was NIC's first INBRE intern and was also an INBRE fellow at UI. She also received the university's Microbiology, Molecular Biology and Biochemistry Department award for Best Ph.D. Student of the Year.

After earning her Ph.D., Fruth noted that she hoped "to use the unique opportunities I was provided and serve future students and young scientists as they strive to meet their lifelong goals." Now a biology instructor at NIC, Fruth has accomplished exactly that.