YOUTH-4-H: Idaho ROKS promotes math, science that’s both challenging and a hoot

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SOME 20 HIGH SCHOOL TEAMS from the Northwest—13 of them from Idaho—entered robots they designed and built themselves in Idaho ROKS First Tech Challenge Feb. 13 at the University of Idaho. Contest winners may go on to international contests and, if the program works as leaders hope, some may even grow up to be engineers.

During the event, teen-aged teams of both boys and girls rubbed shoulders with more than a dozen judges—UI engineering professors, graduate, and undergraduate students.

“We hope these high school students found mentors among the more than dozen judges who are engineering professors and students,” says Tim Ewers, Moscow-based Idaho 4-H Youth Development leader of Idaho ROKS (Robotics Opportunities for K-12 Students).

The biggest draw is building the robots with a team of peers. “Robotics is an integrative applied science. It’s fun. It’s engaging, a game. Yet it requires sophisticated thinking and electronics,” says Ewers. Idaho ROKS responds to the National 4-H Council’s science, engineering, and technology (SET) initiative. In 2007 it set a national goal—1 million youth in high-quality 4-H SET activities by 2013.

High schoolers are the oldest youth that Idaho’s 4-H program tempts into robot-building. During 2009, a total 1,734 students from throughout Idaho participated in 4-H sponsored robotics contests. The youngest were 2nd graders. The biggest numbers—more than 1,000—were middle schoolers (grades 5 through 8). “With Idaho ROKS—a continuous pipeline of robotics contests for all K-12 ages—we believe we have a correct ‘formula’ for increasing numbers of youth engaging in SET,” says Ewers. “Robotics is appealing. It sparks imaginations. Through it, children engage in authentic engineering tasks integrated with real-world significance.”

UI College of Education professor Jim Gregson agrees. University coordinator for science, technology, engineering, and mathematics, Gregson finds Ewers’ 4-H program “exciting. These students learn how to work together, develop leadership skills, address problem, and present their thinking to others. It’s competitive and collaborative. But best of all, young people get so interested they almost forget they are learning.”

Filer HS students do high level fish research

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FILER, A TOWN of barely 2,000 residents on the road between the University of Idaho’s Hagerman Fish Culture Experiment Station and Twin Falls, may be small. But Filer High School students routinely do science that greatly impresses a UI faculty researcher.

“These students are very smart and they carry out a very high level of original research in fish genetics. They’ve exceeded my expectations,” praises Matt Powell, research scientist at Hagerman.

Since 2004, Powell has written some $20,000 in grants to fund summer training of Filer High science teachers Ed Richards and Ken Young in molecular biology at the Hagerman station. The teachers designed a year-long science class attended by students who tackle real-life science questions. This year it’s DNA of Malad River rainbow trout, to learn whether hybridization has occurred between hatchery and wild species.

Students work on $35,000 equipment donated by Hagerman, a world-class fish nutrition and genetics research facility. About hybridization of trout, “It’s too soon to know,” says Powell. But what he does know is, when high school students are sufficiently motivated, “they do amazing things.”
Exergames or kickball? Idaho youth put both to a test

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ONE IN 10 IDAHOANS between the ages of 10 and 17 is obese. In the White Pine 4-H Afterschool Program in Burley, 25 4th to 6th graders participated in a UI Extension study to determine whether Nintendo Wii™ exergames can help. The 16 boys and 9 girls compared the heart-healthfulness and sheer fun of three exergames—Tennis, Boxing, and Dance Dance Revolution—with traditional activities of capture-the-flag and kickball.

Results: During a 20-minute activity, pedometer-strapped youth took an average of 1,171 steps playing capture-the-flag, compared with 802 for Nintendo Wii™ DDR, 789 for kickball, and 746 for Nintendo Wii™ Tennis and Boxing. Also, 59% of kickball players had a 20+point increase in heart rate after 20 minutes, while 44 to 52% of exergame players had 11+point increases.

Cassia County’s UI Extension Educator Grace Wittman, afterschool program coordinator, recommends an hour of physical activity daily for today’s kids. Exergames—while not rivaling marathons—“intrigue” her technology-oriented participants and “provide an alternative to traditional activities,” she says.

Who does what. The experiment station’s core administrative team is based on the University of Idaho’s Moscow campus. However, IAES personnel and research infrastructure reach statewide. Our map shows the experiment station is a complex, integrated network of locations, facilities, and faculty and staff all dedicated to performing research in support of Idaho’s complex agricultural industry and its citizens.

The IAES supports 76 full-time faculty equivalents distributed among approximately 115 faculty members. Supporting them are 145 full-time technical staff including paid student internists. Most CALS faculty with research responsibilities have ‘split’ appointments with additional academic and extension responsibilities. Faculty are typically affiliated with one of 8 academic departments in the college.

How IAES serves the UI and Idaho
The experiment station provides many services to the college and university:

• Idaho Foundation Seed and Nuclear Potato Programs
• Analytical Sciences Laboratory
• Agricultural Statistical Programs
• Life Sciences Technology Transfer and Licensing

Other services include research core facilities such as a Biological Safety Level-3 laboratory, microscopy, advanced equipment for flow cytometry, nucleotide sequencing, plus research mentioned in weekly profiles of R&E centers in this publication.

Budget/Grants. The IAES in fiscal 2009 received an annual appropriated budget of $21 million with 90% from the state and 10% from USDA Hatch Act funds. Faculty researchers in the college currently attract some $17 million a year in external grants and contracts with $6.6 million from USDA, $3.4 million from the National Institutes of Health, and $1.5 million from Idaho’s commodity commissions.

STATE AND NATIONAL RESEARCH priorities by the Idaho Agricultural Experiment Station (IAES) are highly coordinated with the college’s signature programs and U.S. Department of Agriculture’s National Institute of Food and Agriculture. Research programming is also influenced by other Idaho, regional, and federal partners.

This system plays a role in stabilizing Idaho’s economy. UI research in 2006 documented that Idaho agribusiness was responsible for generating $21 billion in total sales, 156,599 jobs, $4.2 billion in wages, $8.4 billion in gross state product—making agribusiness the biggest contributor to Idaho’s economic base (see www.cals.uidaho.edu/edComn/pdf/CIS/CIS1144.pdf).

Partners. IAES partners include agricultural commodity commissions and the Idaho Legislature. Cooperation with Washington and Oregon experiment stations through the Pacific Northwest Tri-State partnership has generated research that steadily improves our agricultural economic competitiveness.

Also, USDA Agricultural Research Service (ARS) scientists are co-located with collaborating IAES researchers at seven research and extension centers throughout Idaho.