University of California 4-H Youth Development Program 2008-2012 California 4-H Science, Engineering, and Technology (SET) Initiative

Improve youth science literacy in, and attitudes for, agriculture, natural resources, and nutrition through educational programming while advancing the research base of youth nonformal science education.

http://www.ca4h.org/set/

Evaluation & Applied Research
Guided by the HPC Strategic Issue Team’s two science literacy questions asking about impacts of participation in community-based youth development programs and impacts of professional development on pedagogical knowledge and skills of science educators.

- Smith, M. & Schmitt-McQuitty, L. (2013). More effective professional development can help 4-H volunteers address need for youth scientific literacy
- Smith, M. (2013). Findings show lesson study can be an effective model for professional development of 4-H volunteers

Journal of Extension

[Book] Advances in youth development: Research and evaluation from the University of California 2001-2010
- Junge, S. & Mangalallan, S. - Professional development increases afterschool staff’s confidence and competence in delivering science, engineering, and technology.
- Mahacek, R. & Worker, S. - Extending science education with engineering and technology: Junk Drawer Robotics curriculum.
- Schmitt-McQuitty, L., & Smith, M. H. - Moving beyond the demonstration model: The importance of experiential learning in the 4-H Youth Development Program.

Professional Development
Effective nonformal education requires well-prepared educators. The 4-H SET Leadership Team facilitates professional development opportunities for 4-H staff and volunteers that focus on pedagogy and process embedded in subject content.

- 4-H Science Promising Practice Articles
  - Authored eight articles published by the National 4-H Council on experiential learning; evaluation; professional development; curriculum; science process skills; fundraising; teens-as-teachers; and partnerships.

State 4-H SET Workshops for Volunteers and Teens
- In 2013: there was a statistically significant (p < .001) improvement in participant understanding on how to encourage youth to investigate their own questions and how to teach youth using techniques other than lectures (e.g., experiential learning).
- In 2010: 91% of the 100 attendees reported increased confidence and understanding of experiential learning and inquiry.
- In 2009: 81% of the 200 participants enhanced their abilities as a SET educator.

4-H State Leadership Conference
- In 2012: 75 youth participated in multiple workshops around SET-related content.
- In 2011: 125 participated in 8 sessions in the areas of biosecurity, robotics, water, and video production. 87% agree that they learned new facts and skills.
- In 2010: 125 participated in 4 day tracks in the areas of engineering, environment, gardening, and animal science. Participants were most likely to absolutely or mostly agree that the sessions enhanced their abilities as science facilitators.
- In 2009: 200 participated in 4-4 SET full day tracks in alternative energy, water, agriculture, veterinary science, chemistry, and robotics.

State 4-H Leaders’ Forum
- In 2012: Four SET workshops engaged over 50 adult volunteers.
- In 2011: Four SET workshops were offered along with a SET challenge from the Junk Drawer Robotics curriculum to all 250 participants.
- In 2010: The theme was “Upgrade, S.E.T. Your System, Get!” and an evening Science Fair showcased 4-H SET curricula and activities to 200 participants.
- In 2009: 4-H SET Professional Development Track was offered on experiential learning, SET Abilities, teens-as-teachers to a group of twenty adult volunteers.
- In 2008: 86% of the 140 participants felt that science, engineering, and technology literacy is very important for today’s young people.

Resource Development
To reach new youth, strengthen existing programs, increase the capacity of staff and volunteers, and conduct quality research, new sources of revenue and support have been cultivated and secured.

Since the formation of the 4-H SET Initiative over $1.5 million has been raised in support of 4-H SET programs, workshops, and curricula. These include federal, corporate, foundation, and private sources.

4-H SET Leadership Team
Andrea Ambrose, Shannon Dogan, Latonya Harris, Lynn Schmitt-McQuitty, Martin Smith, Steven Worker

Curriculum Development
UC ANR academics develop 4-H SET-Ready curricula, based on UC ANR initiatives, that engage youth in science processes, frame learning experiences in the experiential learning cycle, and promote inquiry.

ANR Initiative

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<th>4-H Thematic Area</th>
<th>Water Quality, Quantity, and Security</th>
<th>Sustainable Food Systems</th>
<th>Science Literacy</th>
<th>Sustainable Natural Ecosystems</th>
<th>Science &amp; Engineering Education</th>
<th>Enhance the Health of CA’s Ag Economy</th>
<th>Nutrition</th>
<th>Healthy Families and Communities</th>
<th>Youth Development / Thrive</th>
<th>Endure and Invasive Pests and Diseases</th>
<th>Bio-security</th>
<th>Pre-harvest Food Safety</th>
<th>Green Technologies</th>
<th>Renewable Energy</th>
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Partnerships and Collaboration
Afterschool Programs
California Afterschool Network
California Department of Food and Agriculture
California Science Teachers Association
California State University Faculty Coalition for Science After School Coalition on the Public Understanding of Science
Community Colleges
County Agricultural Commissioners
County Boards of Supervisors
County Resource Conservation Districts
County Water Agencies/Authorities
Duke University
International Society for Technology in Education

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