

During the 2009–2010 school year Washington State LASER hosted a series of 3 Science Partnership Academies attended by science education leaders in Washington State. Each academy lasted 2 to 3 days. Participants completed a presurvey at the beginning of the first academy in December 2009 and a postsurvey near the end of the third academy in May 2010.

Academy Participants

A total of 53 people completed the demographic section of the survey. Key characteristics of the Science Partnership Academy participants include these:

- More than 40% of the participants who completed the survey were Regional Alliance directors or ESD science coordinators.
- All areas of the state were represented and nearly 60% of the participants were from western Washington and the Seattle-Tacoma metropolitan area.
- Two out of 3 participants held a master's degree and 62% of those held a degree in science. Of those with science degrees, most were in biology or life sciences.
- Many of the participants had taught at the K–12 level and nearly 2 out of 3 (64%) had taught at the middle school level.
- Half of the participants who taught science did so for between 6 and 15 years.
- Approximately a fourth of the participants with science teaching experience were teaching in either 2009–2010 or 2008–2009 and 2 out of 3 had taught science within the past 5 years.
- Nearly a third (30%) of those who had taught science education had done so for more than 10 years.

Understanding the Research

One of the Science Partnership Academy objectives was to help participants understand recent literature and its relationship to the work of Washington State LASER. The pre- and postsurveys asked participants to rate their familiarity with a list of references on a scale from 1 (no familiarity) to 5 (very familiar). Of the 10 references listed, participants reported a significant increase in their familiarity with 6 of them.

- Banilower, E., Cohen, K., Pasley, J., & Weiss, I. (2008). *Effective science instruction: What does research tell us?* Portsmouth, NH: RMC Research Corporation, Center on Instruction.
- Cohen, D.K., Raudenbush, S.W., & Ball, D.L. (2003). Resources, instruction, and research. *Educational Evaluation & Policy Analysis*, 25(2), 119–142.
- Donovan, S.M., & Bransford, J.D. (2005). *How students learn: history, mathematics, and science in the classroom*. Washington DC: The National Academies Press.
- Fullan, M., Hill, P., & Crévola, C. (2006). *Breakthrough*. Thousand Oaks, CA: Corwin Press.
- Loucks-Horsley, S., Love, N., Stiles, K.E., Mundry, S., & Hewson, P.W. (2010). *Designing professional development for teachers of science and mathematics, Third edition*. Thousand Oaks, CA: Corwin Press.
- Thompson, C.L., & Zeuli, J.S. (1999). The frame and the tapestry: Standards based reform and professional development. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 341–375). San Francisco, CA: Josey-Bass.

Washington State Science Logic Model

Another objective of the Science Partnership Academy was to familiarize participants with the logic model content developed by Washington State LASER leadership to clarify the direction for future professional development. One portion of the logic model provides a definition—interpreted from research—of the effective science learning experiences for students. The pre- and postsurvey asked participants to assess the degree to which they could recognize each element of effective science learning experiences if observed among students.

For the most part, participants rated their ability to recognize the elements very high on both the pre- and postsurvey. Very slight increases occurred from pre- to postsurvey on all but one item and only one increase was statistically significant: On the postsurvey participants reported increased ability to recognize when

students were communicating and critiquing their scientific ideas and others' ideas.

Professional Development

The surveys included items about the professional development provided by the participants' Regional Alliances organizations. One set of items pertained to the foundational professional development that helps teachers learn to use the instructional modules (frequently referred to as initial use training). The second set focused on further developing teachers' expertise and effectiveness using the materials.

A statistically significant increase occurred from pre- to postsurvey in only 1 of the 8 areas of the foundational professional development: Helping teachers implement formative assessment practices that effectively inform instruction.

Conversely, participants' rating of the developing expertise professional development significantly increased for all but one survey item.

- Prepares teachers to engage students in effective learning experiences
- Develops a deep science content knowledge in area of assignment
- Provides teachers with a solid understanding of what the cognitive sciences tells us about how students learn science
- Helps teachers understand the Science standards and how they influence curriculum and how they relate specifically to the module
- Prepares teachers to effectively use the curriculum materials to provide effective science learning experiences (curricular reasoning)
- Helps teachers develop content specific pedagogical skills
- Helps teachers implement formative assessment practices that effectively inform instruction

Capacity to Support Professional Development

The survey concluded with a section asking participants to assess the capacity of their regional team to implement the key elements of the logic model. Participants reported significant increases in team capacity from the pre- to postsurvey in the following areas.

- Our regional team has a shared vision of effective science teaching and learning practices.

- Our regional team has a shared vision of effective professional development for science teachers.
- Our regional team has a shared vision of a process for implementing effective school based professional development that will help teachers use research-based instructional practices, materials, and assessments to engage students in the Effective Science Learning Experiences.
- Our regional team has a mechanism for developing a cadre of trainers capable of providing foundational professional development on the modules.
- Our regional team has a mechanism for developing a cadre of trainers capable of providing developing expertise professional development on the modules.

Participants did not report any progress in some of the more challenging and complex tasks such as influencing district and school policies and practices or establishing a mechanism for identifying and nurturing instructional leadership.