

GOAL 3: Enhance Faculty Professional Development & Continuing Education

Train the Trainer hosted by Weld-Ed was conducted during Summer 2009 at three sites (California, Pennsylvania, and Texas and relate most closely to Weld-Ed's third goal: Enhancing faculty professional development and continuing education. This was the second year that the train the trainer summer program was offered. Thirty-seven (37) instructors participated in the 2009 training which was an increase over the previous year when only 12 individuals took the training at two sites (Ohio State University and Lorain County Community College).

An evaluation form was circulated at the end of the training to assess participant experiences. Of the 37 instructors attending the training, 24 participants completed a short survey. The results below represent responses from participants from PA and TX. Feedback forms from California were unavailable for analysis.

Given that the ultimate goal of professional development is for participants to apply what they have learned to impact student learning, the evaluation sought to go beyond merely assessing participant reactions immediately after the training session. According to Guskey (1998), in order to connect participation in professional development activities with improved practice, professional development needs to be measured at five levels. The five levels include: a) participant reactions, b) participant learning, c) organizational support and change, d) participant use of new knowledge and skills, and 5) student learning outcomes. This assessment included the first two levels.

Professional Development Evaluation Level I: Participant Experience

Overall, participant rated their professional development experience very highly with all (100%) agreeing that:

- the training increased their knowledge
- the training increased their preparedness to teach concepts
- the training was well organized
- the instructor demonstrated mastery of the subject matter
- the training pace was appropriate
- the content was clearly presented
- as a result of this training, they will implement some additional strategies in their teaching
- they would recommend the training to others

Satisfaction with the training was also high with 71% of participants rating their overall satisfaction as “excellent.” Usefulness of information was rated “excellent” by over one-half of participants (58%).

	Excellent	Above average	Average
Overall satisfaction	71%	25%	4%
Usefulness of Information	58%	33%	8%

To gain deeper insight into their professional development experience and to solicit for suggestions for program improvement, participants were asked open-ended questions in addition to rating scale questions. The following tables contain participant comments:

1. What specific information was of greatest value to you?	2. As a result of this training, what specifically will you do differently when you return to the classroom?
<p>When asked about what was most valuable in the training, a plurality of participants considered metallurgy or metallurgical principles of greatest value. A few mentioned the CD information. Other comments included:</p> <ul style="list-style-type: none"> • Arc physics • Everything • Everything and all great Power Points with labs • Information Arc Welding • Materials joining • Distortions • Specifications & submerged welding • Stress-distortion, physics, symbols • Testing • Physics & Chemistry • Science of Materials Joining 	<p>Given that the goal of professional development is to equip participants with skills that make a difference in their professional practice, instructors were queried about how they planned to use their newly acquired knowledge. Responses varied widely, perhaps, reflecting individual needs and situations. Responses included:</p> <ul style="list-style-type: none"> • Able to explain better the mentioned subjects • Add new information on the overall course, • Start a new syllabus • Be able to teach the technical aspects of welding • Better understanding of metallurgy and the terms • Do a better job of teaching this subject matter • Don't know yet • Implement most of this material that was given • Incorporate into chemistry classes • More in detail about how heat transfer affects material • More joint composition components • More PowerPoint & Movies

	<ul style="list-style-type: none"> • More problem solving • More safety • Teach with more confidence in the content areas • The organization of material • Use a pop quiz • Use of CD program • Use of problems • Use some materials to teach more in depth
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3. What future training or follow-up activities do you need to support the concepts you learned in this seminar?	4. Suggestions for improvement
<p>Professional development participants were asked to consider future training or follow-up activities they might need to supplement what they had just learned. Several participants suggested <i>hands-on welding</i>. Some talked about having a refresher as one participant indicated, “the small time frame makes it difficult to absorb all the information.” Other suggestions were:</p> <ul style="list-style-type: none"> • Offer training on how to teach, including presentations, group control, grading etc • Meet again as a refresher using updated materials • Offer more training on NDE • Physics, symbols, non-Arc welding • power points, visual aids • Study practice, projects • Updates or changes in processes 	<p>The following suggestions for improvement were provided:</p> <ul style="list-style-type: none"> • Pay attention to all the missing materials & make corrections • Correct grammar mistakes in boots-miss pelt words • Correct mistakes on CD's • Correct spelling in PowerPoint • Excellent class • Great job • Have a refresher course in Hawaii in 2010 • I work for a state agency that does not allow out of state training, so the availability of being in state is essential • Keep it going. What a great opportunity you gave me. Thank you. • Have more communication with faculty • Spend more time on new welding processes • Make orthographical corrections • Provide some hands-on welding

Professional Development Evaluation level II: Participant Learning

Guskey’s second level of professional development examines participant learning by measuring knowledge, skills, or changes in attitudes teachers have developed after attending a professional development session. “Determining how much knowledge participants gained from a presentation is impossible to measure without first determining their pre-existing knowledge of the subject (Siegel, Yates, 2007).” Guskey (1998) suggests including some form of pre assessment to determine whether participants already possess the knowledge and skills that will be presented. Lamb and Tschillard (2005) suggest using the retrospective pretest method developed by Campell & Stanley (1963) to measure the pre and post knowledge of professional development participants. According to Ingram, Staten and others (2004), the retrospective pre-test method “allows respondents to reflect back upon their skills prior to receiving training and compare them to their post training skills. Since people at the beginning of an experience may not know what they do not know, asking them to evaluate their competencies now compared with their remembrance of their competencies when they started allows judgments better anchored in reality.” The retrospective pretest method had shown to be effective in measuring self-reported effects of training and education within the field of education (Skeff, 1992; Pohl, 1982; Mezoff, 1981; Howard, 1979).

The Use of the Retrospective Pre-Test Method to Measure Skill Acquisition Among Train-the-Trainer Participants.

The feedback survey implemented with train the trainer program included retrospective pre-test/post-test questions.

Results indicate an overall increase in knowledge. From the perspective of participants, the train the trainer summer program significantly increased conceptual understanding, motivation and confidence to teach concepts in Materials Joining. Paired sample t-test results indicate a significant difference ($p < .001$) between the retrospective pre test and the post-test for *conceptual understanding*, *motivation to teach* and *confidence to teach*.

Retrospective pre-test/post-test scores

Question	Skill Level Before [mean]	Skill Level After [mean]	Mean Change	P-Value
My conceptual understanding of Materials Joining [n=24]	3.21	4.42	1.21	.000
My motivation to teach Materials Joining [n=24]	3.50	4.42	0.92	.000
My confidence to teach concepts in Materials Joining [n=24]	3.29	4.25	0.96	.000

Professional Development Evaluation level IV: Participant use of new knowledge and skills

At the end of fall semester 2009, a follow up survey will be implemented with the summer institute participants to assess application of knowledge and skills. The intent will be to determine how the knowledge acquired in the summer program is being used in the classroom.