These expectations were drawn from the 2007-09 ATE program solicitation issued by the National Science Foundation (www.nsf.gov/ate). They are compiled here to aid grantees and evaluators in program planning, implementation, and evaluation.

Professional Development

- **Audience:** Professional development should serve secondary school teachers and college faculty.
- **Content:** Professional development content should have a direct impact on technician education.
- **Duration:** Professional development should be at least a few days in length and include follow-up activities.
- **Instructional mode:** Professional development should involve secondary school teachers and two-year college faculty working together.
- **Outcomes:** Professional development should enhance participants' disciplinary capabilities, instructional skills, vitality, and understanding of current technologies and practices.
- **Evaluation:** Evaluation of professional development should demonstrate use and assess impact on instructional practices.

Materials Development

- **Audience:** Materials development should serve students planning technician careers and their instructors.
- **Content:** Materials development should involve the creation and national dissemination of print, electronic, and multimedia materials that have been validated and field-tested.
- **Inclusion:** Materials development should include input from experts in business, industry, and government and/or diverse academic institutions on both content and evaluation project aspects.
- **Outcomes:** Materials development should affect the learning environment, course content, and experience of instruction related to science and engineering.
- **Evaluation:** Materials development should demonstrate the impact of the materials on student learning and faculty instruction.

Program Improvement

- **Audience:** Program improvement should serve students in STEM fields.
- **Content:** Program improvement content should enhance curriculum through a coherent sequence of classes, laboratories, and work-based educational experiences.
- **Outcomes:** Program improvement should increase the relevance of technician education, increase the retention of students from enrollment to program completion, and increase the number of skilled technicians in the workforce. The improved program should lead students to an associate degree or certification/competency.
- **Inclusion:** Program improvement projects should include employers and partnerships between 2-year and 4-year institutions.
Evaluation: Evaluation of program improvement initiatives should track and measure the changes in recruitment, retention, graduation, and postgraduate placement; assess impacts on students, including their learning, competencies, certifications, placements in internships, employment, and workplace performance; and assess impacts on employers. (NOTE: Since no evaluation expectations for program improvement are included in the solicitation, these were drawn from the evaluation expectations for national regional centers).

Teacher Preparation

- **Audience:** Teacher preparation should serve future K-12 STEM teachers.
- **Content:** Teacher preparation should expose students to the modern workplace, provide them with real-world experiences involving technology, and strengthen their preparation in math and science.
- **Inclusion:** Teacher preparation projects should include both 2-year and 4-year institutions, including articulation agreements.
- **Instructional Mode:** Teacher preparation should involve the collaboration of faculty from 2-year and 4-year institutions.
- **Outcomes:** Teacher preparation should increase the number, quality, and diversity of prospective K-12 STEM teachers at 2-year colleges with pathways to a 4-year degree.
- **Evaluation:** Evaluation of teacher preparation should measure the effectiveness of recruitment efforts, the number of transfers to a 4-year institution, the increase in student understanding of technology, and the increase in student ability to improve technological literacy. Principal investigators of teacher preparation projects must track students beyond the grant period to determine the number who graduate with teaching credentials, the number who obtain K-12 teaching positions, and their success in the K-12 classroom.

Small Grants

- **Audience:** Small grants should serve faculty and students in secondary and/or postsecondary institutions.
- **Content:** Small grants should improve STEM education and teacher preparation programs, focusing on one or two components or activities relevant to the Program Improvement or Teacher Preparation ATE award areas.
- **Inclusion:** Small grants should include other ATE awardees and faculty members and students.
- **Outcomes:** Small grants should, as a main outcome, act as a prototype for a larger ATE award. Secondarily, small grants should have the aims of the other ATE areas addressed in the project.
- **Evaluation:** Small grants should demonstrate impact the same as that outlined for other ATE award areas addressed by the proposal.

National Centers

- **Audience:** National centers should serve a national audience in technological education reform.
- **Content:** National centers should produce high-quality programs and curricula, provide professional development for educators, and disseminate products and services.
- **Inclusion:** National centers should include a wide range of academic and industrial institutions, including other ATE projects, 4-year colleges and universities, and employers.
- **Outcomes:** National centers should result in collaboration among academic and industrial partners; an increase in recruitment, retention, and postgraduate placement; a sustainability plan; and national visibility.
- **Evaluation:** National centers should measure gains in recruitment, retention, and postgraduate placement, impacts on student learning; and impacts on participating employers and academic institutions. National centers also should conduct product or service evaluations on developed content.
Regional Centers

- **Audience:** Regional centers should serve systemic education reform in a particular technological field for a distinct geographic area.
- **Content:** Regional centers should focus on activities listed under the ATE areas of Professional Development and/or Program Improvement.
- **Inclusion:** Regional centers should include regional employers and academic institutions, including college faculty and secondary school teachers.
- **Outcomes:** Regional centers should reform academic programs and produce workers with skill sets that meet national and industry standards and fit regional workforce needs. Outcomes should be coordinated with local strategic plans and result in institutionalized partnerships between industry and academia.
- **Evaluation:** Regional centers should track and measure the number and quality of recruited students, competencies they achieve, certifications they gain, their placements in internships, graduation, and postgraduation jobs, including their performance in the workplace and employer satisfaction.

Resource Centers

- **Audience:** Resource Centers should serve a national audience of academic institutions, industry, business, government agencies, and secondary schools.
- **Content:** Resource Centers should produce and/or acquire and screen educational materials, ideas, and contacts; provide mentoring and professional development; and establish partnerships with other institutions.
- **Inclusion:** Resource Centers should involve participation from business, industry, government, professional societies, and academic institutions.
- **Outcomes:** Resource Centers should create systematic change in how students in technical fields are prepared for the workforce, including an expansion of the role of community colleges in this endeavor.

Targeted Research

- **Audience:** Targeted research should serve a national audience involved in technician education.
- **Content:** Targeted research should be conducted on technician education, employment trends, the role of technicians in the modern workforce, and/or effective and modern technician education programs. Targeted research should focus on the evaluation criteria for other ATE areas.
- **Inclusion:** Targeted research should include the researcher and 2-year colleges, with 4-year academic institutions, secondary schools, business and industry, professional societies, and other nonprofit organizations as viable options.
- **Outcomes:** Targeted research should produce a question or topic of interest, a research review, original research and analysis, conclusions and connections to the field, and wide dissemination.