



Albert Einstein

Distinguished Educator Fellowship Program

Professional Development Plan Guidance

2016-2017 Fellowship Year

Overview

As an Albert Einstein Distinguished Educator Fellow, you are required to establish an individual professional development plan. The purpose of the professional development plan is to help you as a Fellow identify your professional development goals and establish clear actions for you to take during the fellowship year to make progress in reaching those goals. The fellowship year goes by very quickly, and the resources available to you during the fellowship year present opportunities for professional development that may not exist at any other time in your career. The process of establishing a plan with milestones will help ensure that you make the most of your fellowship experience, both within and outside your host office.

The professional development plan guidance below asks that you select at least two goals from the following three broad goal areas:

- Development of Leadership Skills
- Development as a STEM Educator
- Addressing Grand Challenges in STEM Education

While your initial plan should clearly establish your goals and objectives for the fellowship year, the activities associated with each objective may evolve and change. As such, that part of the document may be updated on a regular basis. It is recommended that you revisit the objectives and planned activities at least monthly. Your Mid-year and Year-end fellowship reports will require an assessment of your progress towards your stated goals and objectives.

You are strongly encouraged to develop your professional development plan in collaboration with your host office mentor.

Professional Development Plan: Goals and Objectives

The following guidance and outline are provided to help you assess and document your goals and objectives. A separate electronic template for your actual plan is available online with the other fellowship forms and guidance.

1. Select at least two of the following three goals areas to focus on for your professional development plan during your fellowship year.
2. Develop a goal statement for each of your chosen goal areas. In the template provided, describe a leadership goal you will address during your fellowship. It is recommended that you use a goal statement with the stem: ***I will...*** (*research, study, learn, apply, etc.*) ***so that...***

3. For each of your goal statements, develop 2-3 objectives that you plan to meet in order to achieve your goal. Consider both near/mid-term (2-4 months) and long term (8-9 months) objectives.
4. Within each objective, identify two or more specific activities or actions that you will engage in to achieve the objective. These may include a combination of activities or events you have personally arranged or sought out; activities or events that are part of your host office assignments and duties; and/or activities and events organized by ORISE for the Fellowship program. *This section of your professional development plan should be updated monthly or as activities are completed and opportunities for new activities arise, which could be as frequently as monthly.*

In selecting your professional development goals and objectives for the fellowship year, consider your interests and needs for your own professional development, as well as the resources and opportunities available to you during the fellowship year. Suggested reading and additional resources are listed at the end of this document.

Goal Areas

I. DEVELOPMENT OF LEADERSHIP SKILLS GOAL

Consider for this goal, the following:

- Gaining knowledge and skills to more effectively lead people.
- Gaining knowledge and skills to more effectively lead change.
- Gaining knowledge and skills to more effectively lead for results.
- Gaining knowledge and skills to more effectively build partnerships and coalitions.
- Understanding leadership skills in the context of the classroom, school, and district.

II. DEVELOPMENT AS A STEM EDUCATOR GOAL

Consider for this goal, the following development needs:

- Improving content knowledge in a particular STEM field.
- Improving knowledge and use of STEM education resources for the classroom.
- Improving instructional practice and effectiveness in the classroom.
- Developing innovative instructional methodologies.

III. ADDRESSING GRAND CHALLENGES IN STEM EDUCATION GOAL

For this goal, consider the following challenges in STEM education and your knowledge of the national, state, and local policies and programs that influence them:

- Recruiting and retaining STEM educators, including certification pathways.
- Offering relevant, high quality, and measurable STEM teacher professional development.
- Involving stakeholders such as business and industry leaders to identify key workforce issues to understand what encompasses quality STEM preparedness.
- Understanding equity and broadening the STEM education pipeline, especially to women and students from under represented backgrounds, such as students with disabilities and limited English proficient students.

- Increasing avenues for informal STEM education (hands-on STEM competitions, integration of informal learning with classroom strategies, state of the art educational technologies) and sustaining investments in STEM-related educational research and innovation.
- Measuring federal STEM education program effectiveness and/or impacts for STEM-related programs outlined in the Every Student Succeeds Act.

Also consider: 1) how you might identify and learn from case studies or schools/ districts that are leading change and making a difference; 2) how you might take the knowledge and experience from your fellowship back to your school/district during or at the end of your fellowship term; or 3) how you may inform or impact the activities of your sponsoring agency or host office.

Suggested Resources

DEVELOPMENT OF LEADERSHIP SKILLS

- Blankstein, Alan and Pedro Noguera with Lorena Kelly (2016): [*Excellence Through Equity: Five Principles of Courageous Leadership to Guide Achievement for Every Student*](#)
- *Critical Practices for Anti-Bias Education: Teacher Leadership* (2014). [Teaching Tolerance](#)
- Desimone, L. (2009). *Improving impact studies of teacher professional development: Toward better conceptualizations and measures*. Educational Researcher, 38(3), 181-199.
- *Leaders of Learning: How District, School and Classroom Leaders Improve Student Achievement* (2011), Robert J. Marzano and Richard DuFour, Solution Tree Press
- *The Leadership Challenge: How to Make Extraordinary Things Happen in Organizations*, James Kouzes and Barry Posner (2012), Jossey-Bass.
- *The New Meaning of Educational Change*, Michael Fullan (2007), Teachers College Press, 4th edition.
- *Switch: How to Change Things When Change is Hard*, Chip and Dan Heath (2010), Broadway Books.

DEVELOPMENT ASA STEM EDUCATOR

- **Armstrong, Thomas (2016)** [The Power of the Adolescent Brain: Strategies for teaching middle and high school students](#)
- **Association for Supervision and Curriculum Development (ASCD)**. A non-profit organization dedicated to advancing best practices and policies for the success of each learner provides an expert and innovative solutions in professional development, educational leadership and competence building. <http://ascd.org>
- **Change the Equation**. Change the Equation “works at the intersection of business and education to ensure that all students are STEM literate by collaborating with schools, communities and states to adopt and implement excellent STEM policies and programs.” <http://changetheequation.org/>
- Knight, J. (2011), *Unmistakable Impact: A partnership approach for dramatically improving instruction*. Thousand Oaks, CA: Corwin and Learning Forward. Description of a necessary alignment professional learning for teachers that ensures a positive change in student learning.
- **Learning Forward**, (2012). Learning Forward is an education association working solely to

increase student achievement through more effective professional learning.

<http://www.learningforward.org/home>

- Marshall, Jeff (2016) [*The Highly Effective Teacher: 7 Classroom Tested Practices That Foster Student Success*](#)
- **Marzano Research Laboratory.** Marzano Research Laboratory is a joint venture between Robert J. Marzano and Solution Tree. It combines Dr. Marzano's "40 years of educational research with continuous action research in all major areas of schooling."
<http://www.marzanoresearch.com/>
- Ross, J.D. (2011), *Online Professional Development*. Thousand Oaks, CA: Corwin. A guide of practical framework founded on proven principles of professional learning and instructional design helps to create cost-effective online professional development courses.
<http://www.corwin.com/books/Book234963>
- **Work To Do: The Role of STEM Education in Improving the Tri-State Region's Workforce.** (2014). The Carnegie Science Center. This study of a rural perspective on STEM education was conducted by Campos Research Strategy. Proposes five obstacles to STEM education.

GRAND CHALLENGES IN STEM EDUCATION

- **American Institutes for Research.** *Essential Components of Response to Intervention (RTI)*, <http://www.rti4success.org/>
- **Center for American Progress.** McGuinn, P. *The State of Teacher Evaluation Reform*, November 2012, http://www.americanprogress.org/wp-content/uploads/2012/11/McGuinn_TheStateofEvaluation-1.pdf
- **Common Core State Standards (CCSS).** Common Core State Standards include standards for mathematics and for English Language Arts/literacy, which include literacy standards for social studies, science and technical subjects. <http://www.corestandards.org/>
- *Pellegrino, J.W. et al (2014), Developing Assessments for the Next Generation Science Standards.* Washington DC: The National Academies Press. "This book develops an approach to science assessment to meet the vision of science education for the future as it has been elaborated in *A Framework for K-12 Science Education (Framework)* and Next Generation Science Standards (NGSS)." <http://www.nap.edu/catalog/18409/developing-assessments-for-the-next-generation-science-standards>
- **Education Commission of the States.** High School STEM Initiatives database.
<http://www.ecs.org>
- Honey, M., Pearson, G., & Schweingruber, H. (2015), *STEM Integration in K-12 Education; Status, Prospects, and an Agenda for Research*, Washington DC: The National Academies Press. "STEM Integration in K-12 Education examines current efforts to connect the STEM disciplines in K-12 education. The report reviews the evidence for the impact of integrated approaches on various student outcomes, and it proposes a set of priority research questions to advance the understanding of integrated STEM education." <http://www.nap.edu/catalog/18612/stem-integration-in-k-12-education-status-prospects-and-an>
- Identifying and Supporting Productive STEM Programs in Out-of-School Settings by the Committee on Successful Out-of-School STEM Learning. The National Academies Press, 2015.
<http://www.nap.edu/catalog/21740/identifying-and-supporting-productive-stem-programs-in-out-of-school-settings>
- **National Academy of Engineering.** STEM Education: Progress and Prospects (2013).
<https://www.nae.edu/Publications/Bridge/69735/69737.aspx>

- **National Academy of Sciences.** *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads* (2011), http://www.nap.edu/catalog.php?record_id=12984
- **National Academy of Sciences, Board on Science Education.** *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (2012), http://sites.nationalacademies.org/DBASSE/Topics/DBASSE_068935
- **National Research Council.** *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century* (2013), http://www.nap.edu/catalog.php?record_id=13398
- **National Science Board.** *Science and Engineering Indicators* (2012), <http://www.nsf.gov/statistics/seind12/>
- **Next Generation Science Standards (NGSS).** <http://www.nextgenscience.org/next-generation-science-standards>
- **Project Red.** *One-to-One Institute.* Developing successful and sustainable one-to-one computing programs. <http://www.one-to-oneinstitute.org/>
- **National Science Foundation.** *Resources for STEM Education.* Included are several seminal reports by committees of the National Research Council, which synthesize research on STEM teaching and learning and have been published through the National Research Council's National Academy Press. <http://www.nsfresources.org/home.cfm>
- **STEM and People with Disabilities** (2011). Ensuring that students with disabilities have equal access to STEM academic programs and careers is critical. University of Washington. <http://www.washington.edu/doit/Video/index.php?vid=53>

STEM RESOURCES

- **American Chemical Society (ACS).** Founded in April 6, 1876, at the College of Pharmacy in New York, "ACS is a congressionally chartered independent membership organization which represents professionals at all degree levels and in all fields of chemistry and sciences that involve chemistry." <http://www.acs.org/content/acs/en.html>
- **American Geophysical Union (AGU).** Established in 1919 by the National Research Council, AGU "galvanizes a community of Earth and space scientists that collaboratively advances and communicates science and its power to ensure a sustainable future." <http://www.agu.org>
- **American Institute of Physics (AIP).** Dedicated to the development of physics, AIP "serves a federation of physical science societies in a common mission to promote physics and allied fields." <http://www.aip.org/>
- **ASM International (ASM).** ASM is a materials science and engineering society which sponsors teacher camps to show educators "new ways to make teaching math and core science principles more exciting and accessible to students." <http://www.asminternational.org/foundation/teachers/teacher-material-camps>
- **Code.org.** This nonprofit organization is "dedicated to expanding participation in computer science by making it available in more schools, and increasing participation by women and underrepresented students of color." They have free curricular resources and tutorials and lead Hour of Code™. <http://code.org/>
- **Computer Science Teachers Association (CSTA).** CSTA "supports and promotes the teaching of computer science and other computing disciplines. CSTA provides opportunities for K-12 teachers and students to better understand the computing disciplines and to more successfully prepare themselves to teach and learn." <http://csta.acm.org/>

- **Discovery Education.** Discovery Education “accelerates school districts’ digital transition through comprehensive standards-based content, professional development, formative assessment, and community engagement proven to positively impact student achievement.” <http://www.discoveryeducation.com/>
- **Environmental Protection Agency (EPA).** The EPA offers an array of environmental and science- based lesson plans, activities and ideas, including around Earth Day. <http://www.epa.gov/students/teachers.html>
- **Exploravision.** Exploravision is a science competition in which a teacher will sponsor and lead students as they work in groups to simulate real research and development. <http://www.exploravision.org/>
- **FIRST Robotics.** FIRST robotics “combines the excitement of a sport with the rigors of science and technology. Under strict rules, limited resources, and time limits, teams of 25 students or more are challenged to raise funds, design a team ‘brand’, hone teamwork skills, and build and program robots to perform prescribed tasks against a field of competitors.” <http://www.usfirst.org/roboticsprograms/frc>
- **Illustrative Mathematics.** Illustrative mathematics contains vetted math tasks created by educators which are aligned to the Common Core State Standards for mathematics. <https://www.illustrativemathematics.org/>
- **Implementing the Mathematical Practice Standards.** This is an EDC project funded by the National Science Foundation to develop illustrations of mathematical tasks; the primary use is for teacher learning about the standards for mathematical practice with some designed for classroom use. <http://mathpractices.edc.org/>
- **International Society for Technology in Education (ISTE).** ISTE is” the premier nonprofit organization serving educators and education leaders committed to empowering connected learning in a connected world.” <https://www.iste.org/>
- **National Aeronautics and Space Administration (NASA) for Educators.** Since 1958, NASA as a part of the United States government is in charge of U.S. science in technology in air and space. NASA's education office works with teachers and students to get them inspired to become engineers, scientists and astronauts. <https://www.nasa.gov/audience/foreducators/index.html>
- **National Association of Biology Teachers (NABT).** Since 1938, thousands of educators have joined the association to share their experiences and expertise with colleagues from around the world, keep up with trends and developments in the field, and grow professionally. <http://www.nabt.org>
- **National Council of Teachers of Mathematics (NCTM).** NCTM “is the public voice of mathematics education, supporting teachers to ensure equitable mathematics learning of the highest quality for all students through vision, leadership, professional development, and research.” <http://www.nctm.org/>
- **National Geographic.** National Geographic is an enormous online resource for educators, providing online materials featuring maps, photos, videos and daily news stories, as well as articles and features about animals, the environment, cultures, and history. <http://education.nationalgeographic.com>
- **National Institute for Mathematical and Biological Synthesis (NIMBioS).** “NIMBioS Education and Outreach program offers a diverse array of activities to meet the educational needs for learners of all ages. NIMBioS initiatives focus on the enhancement of education at the interface between mathematics and biology...” <http://www.nimbios.org/education/>

- **National Institute of Standards and Technology (NIST).** NIST has summer institutes for middle school science teachers featuring hands-on activities, lectures, tours and visits with NIST scientists and engineers in their laboratories. <http://www.nist.gov/iaao/teachlearn/index.cfm>
- **National Instruments (NI).** “NI believes the best way to encourage students to pursue careers in engineering and science is to give them fun, hands-on experiences with real-world engineering tools.” <http://www.ni.com/company/programs/inspire/>
- **National Marine Sanctuaries.** National Marine Sanctuaries serve as trustees for a network of 14 marine protected areas. They have multiple education resources. <http://sanctuaries.noaa.gov/welcome.html>
- **National Math and Science Initiative (NMSI).** NMSI “was formed to address one of this nation’s greatest economic and intellectual threats- the declining number of students who are prepared to take rigorous college courses in math and science and equipped for careers in those fields.” <https://www.nms.org/>
- **National Oceanic and Atmospheric Administration (NOAA) Education.** NOAA is a federal agency focused on advancing our understanding of and ability to anticipate changes in the Earth’s environment. It connects education and students to great range of online materials and science resources. <http://www.education.noaa.gov/>
- **National Park Service.** The National Park Service offers distance learning, field trips and curricular materials in addition to professional development opportunities. <http://www.nps.gov/teachers/index.htm>
- **The National Science Digital Library (NSDL).** Created by the National Science Foundation (NSF), NSDL provides “high quality online educational resources for teaching and learning, with current emphasis on the sciences, technology, engineering, and mathematics (STEM) disciplines...” <http://nsdl.org/>
- **National Science Teachers Association (NSTA).** NSTA was founded in 1944 and is the “largest organization in the world committed to promoting excellence and innovation in science teaching and learning for all.” <http://www.nsta.org/default.aspx>
- **NBC Learn.** For over 80 years, “NBC News has been documenting the people, places and events that shape our world. NBC Learn, the educational arm of NBC News, is dedicated to making these historic stories, images and primary source documents available on-demand to teachers, students, and parents.” <http://www.nbclearn.com/portal/site/learn>
- **PBS Teachers.** PBS learning media is “a next-generation digital media service that empowers preK- 12 teachers to re-imagine classroom learning, transform teaching and creatively engage students.” <http://www.pbslearningmedia.org>
- **PolarTREC.** In this program, K-12 teachers spend 3-6 weeks participating in hands-on field research in polar regions. The goal of PolarTREC is to invigorate polar science education by bringing together K-12 educators and polar researchers together. <http://www.polartrec.com/>
- **Project Lead the Way (PLTW).** PLTW “is the nation’s leading provider of science, technology, engineering, and math (STEM) programs. Through world-class K-12 curriculum, high-quality teacher professional development, and outstanding partnerships, PLTW is helping students develop the skills needed to succeed in the global economy.” <https://www.pltw.org/>
- **Relevant Education in Math and Science (REMS).** REMS are designed to provide improved understanding and retention of mathematical and scientific concepts through the use of engineering practices. <http://www.rit.edu/kgcoe/remts>
- **Siemens Competition.** Since 1999, this competition “seeks to promote excellence by encouraging students to undertake individual or team research projects. It fosters intensive

research that improves students' understanding of the value of scientific study and informs their consideration of future careers in these disciplines."

<https://siemenscompetition.discoveryeducation.com/>

- **Smithsonian.** "The Smithsonian seeks to bring content experts and educators together to help strengthen American education and enhance our nation's ability to compete globally. The Smithsonian serves as a laboratory to create models and methods of innovative informal education and link them to the formal education system." <http://www.si.edu/Educators>
- **Technology Student Association (TSA).** TSA is "the oldest student organization dedicated exclusively to students enrolled in technology education classes grades K-12. TSA is supported by educators, parents and business leaders who believe in the need for a technologically literate society." <http://tsaweb.org/>
- **U.S. Department of Energy's National Science Bowl.** The National Science Bowl is a nationwide academic competition that tests secondary students' knowledge in all areas of science and mathematics. <http://science.energy.gov/wdts/nsb/>