Mathematics & Computer Science Service Learning Resources

The Alford Center for Service-Learning offers logistical, conceptual, material, and financial support for service learning classes and projects that Denison faculty are interested in creating/pursuing.

“Service-learning in the mathematics curriculum provides a rich opportunity for students to learn while contributing to their communities. Service-learning in higher education integrates community service with academic instruction. Students participate in organized curricular projects that address community needs, while enhancing their academic knowledge and skills and fostering civic responsibility.

Examples of mathematics service-learning experiences include tutoring, environmental data monitoring and analysis (statistics), building structures (geometry--slopes and angles), and designing transportation routes (discrete / combinatorial math). Mathematics service-learning projects can be a mechanism for effectively translating seemingly abstract principles such as algebra, geometry, and trigonometry into practice. Through service-learning experiences, students are able to see renewed value in their education by meeting community needs, applying knowledge to real-world situations and effectively making a difference.”

(Rachel L. Vaughn, Sarena D. Seifer, and Tanis Vye Mihalynuk, Community-Campus Partnerships for Health, May 2004, as cited by Learn and Serve America’s National Service-Learning Clearinghouse)

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I. Math Service Learning
1) Mathematics Umbrella Group: Descriptions of Real-World Math Projects conducted by University of South Florida Students
   http://shell.cas.usf.edu/math/mug/index.htm
***Example projects range mathematics in engineering, life/earth sciences, economics, and pre-health. SEE PROJECT SUMMARIES: http://shell.cas.usf.edu/math/mug/projectindex.htm
***Great site for a huge variety of ideas about how to apply mathematical skills in the community. This site is intended to inform students and the community about real-world mathematics application projects. We also call these mathematics - business/science projects (MBSPs). Collaboration of USF students with faculty and administrators gives the MUG-MBSP program continued vitality.
2) RadicalMath
http://www.radicalmath.org/
"RadicMath is a resource for educators interested in integrating issues of social and economic justice into their math classes and curriculum. On this website you will find links to access and download over 700 lesson plans, articles, charts, graphs, data sets, maps, books, and websites to help you bring these issues into your classroom."
***This website is more for high school level math than college, but it has amazing ideas.

3) Campus Compact Service Learning Math SYLLABI:
Mathematics Appreciation class in which students “select a nonprofit service agency that requires statistical research for program evaluation, public needs assessment, or public relations and support. Assist the agency, based on its needs, *in developing a survey tool, organizing and/or conducting the survey, compiling and analyzing data, or some combination of these or some other statistical undertakings.”

4) Prof. Victor J. Donnay @ Bryn Mawr College
http://www.brynmawr.edu/math/people/donnay/
**See links for community education projects. Victor J. Donnay is Professor of Mathematics at Bryn Mawr College, where he employs a variety of creative teaching strategies to better help his students enjoy and learn mathematics. He teaches many differential equations classes and his area of research is chaotic properties of dynamical systems.
**See “Ordinary Differential Equations in Real World Situations” Syllabus:
http://serc.carleton.edu/sencer/ode_real_world/index.html

5) Articles and Classes by Joe Malkevitch @ York College
A) Mathematics of Fairness Course-- Prof. Malkevitch @ York College
http://york.cuny.edu/~malk/courses/fairness-outline.html
Humanities and Mathematics course covering a broad range of mathematical issues in society: ethical philosophy, game theory, election and voting methods, weighted voting, apportionment, proportional representation, common-pool resources, organ transplant programs, auctions, taxes, bankruptcy models.
B) Articles on Voting Fairness and Bankruptcy Disputes
1) The Mathematics of Voting and Elections (March 2002)
http://www.ams.org/featurecolumn/archive/voting-introduction.html
2) Apportionment of Legislative Representatives, Part I and Part II (May and June 2002)
http://www.ams.org/featurecolumn/archive/apportion1.html
3) Resolving Bankruptcy Claims (March 2005)
http://www.ams.org/featurecolumn/archive/bankruptcy.html

6) MAC3
Mathematics Across the Community College Curriculum
http://www.amatyc.org/
**Interdisciplinary and Community-based Mathematics Courses
**Includes Syllabi of hundreds of math courses** “The goal of Mathematics Across the Community College Curriculum (MAC3) is to create a mathematically literate society that ensures a workforce equipped to compete in a technologically advanced global economy.”

7) **List of a Variety of Math Service Learning Classes at Louisiana State University:** Professors can be contacted for more information about a course.

8) **“Fair Division”: Online Handbook of Political Economy**, Chapter by Steven Brams
   http://www.nyu.edu/gsas/dept/politics/faculty/brams/fd_handbook.pdf
   “In this review, I will give a brief survey of three different literatures: (i) division of a single heterogeneous good (e.g., a cake with different flavors or toppings); (ii) division, in whole or part, of several divisible goods; and (iii) allocation of several indivisible goods.”

9) **Blackstone Collaboratory & Prof. Catherine A. Roberts** @ the College of the Holy Cross.
   See Ch 2.1 of Hadlock (2005) for full length description of courses in mathematical modeling.
   The Blackstone Collaboratory will bring together natural scientists, mathematicians, historians and economists from Holy Cross and the region to address key scientific questions related to the environmental health of the Blackstone River. Roberts will serve as director of the Blackstone Collaboratory, coordinating courses, programs, student internships, faculty and community partners, including the Blackstone River Coalition, the Blackstone River Science Collaboratory, the National Park Service, and the Regional Environmental Council. Roberts is Associate Professor of Mathematics at the College of the Holy Cross. Roberts’ work as the editor of the journal Natural Resource Modeling led to her leadership in the development of a recreational use model for white water rafting traffic on the Colorado River for the Grand Canyon National Park.

10) **Math & Service-Learning in Higher Education**
    Includes a variety of on-line and print resources. Most of these resources are summarized and listed in THIS resource sheet.
    http://www.servicelearning.org/instant_info/fact_sheets/he_facts/math_he/

A) **Single Courses/Projects**
1) **Math 3370: Combinational Mathematics and Snow Plow Route Calculations** @ the University of Minnesota Morris
   Syllabi: http://www.morris.umn.edu/~pehng/Quarters/Ma3370/syllabus.html
   Service Learning Project Description:
   http://www.morris.umn.edu/~pehng/Quarters/Ma3370/proj.pdf
   Summary of the project: http://www.morris.umn.edu/ummnnews/View.php?itemID=182

2) **List of Math Service Learning Courses in 1995-6** @ UMM
   For more information, please contact the Professors:
   http://www.morris.umn.edu/academic/sl/history.html

3) **Math Appreciation Class**

4) **Examples of Math Service Learning Classes at Keene State College**
B) Statistics Courses
   The syllabus explains the course set-up of a Statistics course that incorporates optional service learning: a statistical survey of a local community service agency.

2) Statistics Service Learning by Dr. Gina Reed @ Gainesville State College
   [https://web.gsc.edu/fs/greed/slprojects.htm](https://web.gsc.edu/fs/greed/slprojects.htm)
   Students assist Challenged Child, a local, non-profit agency, by providing statistical consulting. CC gives a mid-year evaluation survey to parents every year, and they need statistical analysis on the survey questions.

3) Statistical Literacy Resources Online
   Statistical Literacy studies summary statistics used in everyday arguments. Statistical literacy is the ability to read and interpret statistics in everyday graphs, tables, statements and studies.

4) Quantitative Literacy Course using Real World Examples @ Dartmouth College
   Chance is a quantitative literacy course developed cooperatively by the Chance Team: J. Laurie Snell and Peter Doyle of Dartmouth College, Joan Garfield of the University of Minnesota, Tom Moore of Grinnell College, Bill Peterson of Middlebury College, and Ngambal Shah of Spelman College. We were assisted by grants from NECUSE and the National Science Foundation's Undergraduate Curriculum Development Program. The goal of Chance is to make students more informed, critical readers of current news stories that use probability and statistics.

5) Statistical analyses of Gaps in Socioeconomic status between nation states

C) Practicum/ Senior-level Internships
1) Applied Mathematical Research Experience (AMRE) by Dr. Ramsay @ The College of Wooster
   [http://www.wooster.edu/amre/](http://www.wooster.edu/amre/)
   AMRE is a program initiated by the Mathematical Sciences Department designed to give students from the College of Wooster experience in the practical applications of mathematics and computer science which the classroom cannot provide. For eight weeks of the summer, student teams and faculty advisors from the College of Wooster are joined with a (usually local) business, industry, or agency (client). This partnership is beneficial to all involved. The student participants are exposed to the practical applications of mathematics and computer science in a "real world" setting and acquire knowledge which will aid them in their senior independent study and later in life. The faculty advisors have the opportunity to be involved with a very select group of students in a summer activity, while contributing to research in the fields of applied mathematics and computer science. Clients have the opportunity to tangibly support education
and, at a low cost, obtain solutions to problems that would most likely not be addressed internally.

***Please see website for a list of 14 years’ worth of projects.

** Also See Ch. 2.3 of Hadlock (2005) for full length description

2) 390 Mathematics Practicum by Dr. Steve McKelvey @ Saint Olaf College
See Ch 2.2 of Hadlock (2005) for full length description of the practicum.
See description of 390 MP: [http://www.stolaf.edu/catalog/academicprogram/math.html](http://www.stolaf.edu/catalog/academicprogram/math.html)
During January, two or three teams of five students work for a month on real industrial problems and present their results to scientists and executives of the company that posed the problem.
Recent Practicum topics include: 1) Time-Efficient Suturing During Cardiac Surgery Estimation of Minimum Freight Car Needs, 2) Optimal Positioning of Manufacturing Equipment, 3) Load Factors for Airline Scheduling, and 4) Federal Fairness Test for Benefit Plans.

***Steve McKelvey’s homepage & contact info: [http://www.stolaf.edu/people/mckelvey/](http://www.stolaf.edu/people/mckelvey/)

II. Computer Science Service Learning
A) General Info.
1) Computer Science and Information Technology (CSIT) Service Learning Center @ Parkland College
[http://slc.csit.parkland.edu/](http://slc.csit.parkland.edu/)
“At the Service Learning Center, CSIT students employ their education, skills, and hands-on training to provide IT support for non-profit organizations, non-commercial community projects, senior citizens, and disabled persons. In return, students gain experiential learning as they work closely with community clients to manage projects with “real-world” specifications and timeframes.”

2) “Making Service Learning Accessible to Computer Scientists” by Prof. Brian Rosmaita @ Hamilton College full text available online @: [http://academics.hamilton.edu/computer_science/brosmait/talks/2007-03-10/index.html](http://academics.hamilton.edu/computer_science/brosmait/talks/2007-03-10/index.html)

3) “Service Learning in Computer Science and Engineering” @ Purdue University
Viewpoints of seven computer science professors from multiple universities.

4) Computer Science Peru Immersion Project @ University of South Florida
Chris Brooks discusses his undergrad computer science class’s Peru Immersion project which works to bridge the digital divide.

5) “Computer Science and service learning: Empowering nonprofit organizations through open source content management systems” @ John Carroll University w/ Linda Seiter
Description of upper level course: “CS444 Adaptive and Open Software Systems is a new upper level elective taken by both Computer Science (CS) and Computer Information Systems (CIS) majors at John Carroll University.”

6) Resource Sheet on Computer Science Service Learning
[http://www.servicelearning.org/search/apachesolr_search/service%20learning%20opportunities%20in%20computer%20science](http://www.servicelearning.org/search/apachesolr_search/service%20learning%20opportunities%20in%20computer%20science)
Includes links to specific CS course syllabi at Southwest Minnesota State University, Wheaton College, and more… Includes many ideas and discussions on computer science service learning.

**B) Problem-Based**

1) **Campus Compact Computer Science SYLLABI:**
   

   Campus Compact recently examined over 900 service-learning syllabi. Of these 900 syllabi, CC chose 300 exemplary service-learning syllabi across a wide variety of disciplines and put them on their service learning resources web-site.

2) **Engineering Projects in Community Service (EPICS)**
   
   A national program for engineering and computer science learning projects. Form and focus of each EPICS program varies a lot from campus to campus.

   **A) EPICS @ Purdue University**

   https://engineering.purdue.edu/EPICSNational/About/Overview

   [http://epics.ecn.purdue.edu/about/overview.php](http://epics.ecn.purdue.edu/about/overview.php)

   “The Engineering Projects in Community Service (EPICS) program, created at Purdue University in 1995, provides a curricular service-learning structure that enables these two groups to work together and thereby satisfy each other’s needs. EPICS enables long-term projects in which teams of 12 to 15 undergraduates from engineering, CS, and other disciplines are matched with community agencies.”

   **B) EPICS @ Butler University w/ Prof. Jon Sorenson**

   “EPICS is about producing software for charity or non-profit organizations. Our goal is to practice the software lifecycle and the many intangibles that go along with developing large pieces of software.”

3) **Computer Science and Engineering Service Projects @ Notre Dame**

   [http://socialconcerns.nd.edu/faculty/cbicourses.shtml](http://socialconcerns.nd.edu/faculty/cbicourses.shtml)

   **Click on any semester’s course list and then scroll down to the “College of Engineering” service learning course descriptions for courses in computer science and engineering.**

   **Also see Supplementary Majors: Computer Applications courses in each semester’s course listings**

4) **Computer Science Service Project @ Fort Lewis College Colorado**

   [http://www.sigchi.org/chi95/proceedings/socpost/sjz_bdy.htm](http://www.sigchi.org/chi95/proceedings/socpost/sjz_bdy.htm)

   “This paper shows, by describing the analysis, design and implementation of relational database for community child care providers, the need for technical service donations to human service organizations. These donations have both an educational use (appropriate for academe or industry) and a beneficial outcome for the sponsoring organization.”

5) **A) Keene State College Service Learning Courses in Computer Science**

   [http://sl.keene.edu/projects](http://sl.keene.edu/projects)

   **B) Computer science students @ KSC created a wiki page for the service learning department**

   [http://sl.keene.edu/](http://sl.keene.edu/)

   **C) Direct Service**
1) Computer Science Service Learning Courses @ Pace University’s Seidenberg School of Computer Science and Information Systems
http://support.csis.pace.edu/CSISWeb/webContent/eCommunique/eCommunique_Summer_2006.html
“In recent years, service learning has become an integral part of courses offered through the Technology Systems Department. Students enrolled in one of several sections of CIS 102 Web Design for Nonprofit Organizations or TS 105 Computers for Human Empowerment have the opportunity to assist any number of organizations by developing Web sites to raise their visibility or are empowered to share their newly acquired technology knowledge with various populations in the surrounding community.”

2) Computer Science Service Learning: Setting Up a Server at a Local High School and Volunteering to Study the Effects of Computing on Society
http://portal.acm.org/citation.cfm?id=1352383.1352430

3) High school teacher on-going education: Victor J. Donnay @ Bryn Mawr
http://serendip.brynmawr.edu/local/
B) Computer Visualization in Mathematics describing how computer visualization can be used to give an intuitive understanding of complex ideas in modern mathematics.
http://www.brynmawr.edu/math/people/donnay/vjdwebpage/EducationInterests/ComputerVisualization/ComputerVisualization.htm

III. Undergraduates Teaching/Tutoring Children and Youth
1) The Algebra Project
http://www.algebra.org/history.php
"The Algebra Project was founded in 1982 by a Harlem-born and Harvard-educated Civil Rights' leader, Dr. Robert P. Moses through the use of his MacArthur Fellowship award. Over the past two decades, AP grew from teaching math in one school in Cambridge, MA, to more than 200 middle schools across the country by the late 1990s, developing successful models of whole-school and community change." AP's unique approach to school reform intentionally develops sustainable, student-centered models by building coalitions of stakeholders within the local communities, particularly the historically underserved population.

2) Science and Theatre Magic Program (STMP) @ Villanova University
http://www.csc.villanova.edu/~magic/
Villanova University is proud to offer a unique multidisciplinary summer program for creative 13-17 year olds who love science and are interested in teaching and performing for younger kids from Philadelphia. Villanova faculty, staff, and students work alongside young scholars in university laboratories and special workshops, helping them create, plan, and perform in an all-American School of Magic. Some of the specific magic programs have a focus on computer science: a) see Way, Nordengren, Papalaskari, Metzger, Nadi, Styer, et al. in the computer science reference section of this resource sheet.
3) Mathematics, Engineering, Science Achievement (MESA) Program.
http://mesa.ucop.edu/home.html
One of the country's most innovative and successful programs, MESA works with thousands of educationally disadvantaged students so they excel in math and science and graduate with math-based degrees.

4) Math Science Partnership of Greater Philadelphia (MSPGP)
http://www.mspgp.org/about.html
“MSPGP is a National Science Foundation funded research grant whose aim is to improve student access to, and achievement in, challenging and advanced courses in mathematics and science; to improve the quality, quantity, and diversity of the teacher workforce through cultivation and professional development; and to understand, through research, how to effectively perform those tasks. MSPGP focuses on improving secondary mathematics and science, grades 6-12, in an "open loop" environment typical of sprawling, densely-populated greater metropolitan areas containing hundreds of school districts and dozens of institutions of higher education.”

5) Student’s Reflections on Math S.L. w/ middle school students@ California State University
http://www.calstate.edu/ITL/exchanges/research/1217_Strage_etal.html
“We report on students’ reflections, expectations, and performance in an assessment, primarily qualitative, of the infusion of a service-learning component into a college mathematics course designed for undergraduates preparing to be K-8 teachers. Our analysis of student self-reports, along with measures of performance in their mathematics course, seems to confirm that a service-learning component assisting in a middle school mathematics classroom helps students to develop a more secure mastery of the mathematics content of their own course; a better appreciation of how to teach that content to middle-school students; and a more realistic picture of teaching in a public school environment, and whether this was a career goal they wanted to pursue.”

6) Math + Civic Engagement = Success for Louisiana State University Students and the Community
“Nicholson Elementary credits math tutors for 100% of 4th graders passing LEAP exams.”
Service-Learning and University/Community Relations power point of LSU
Through tutoring, online resources, and research, faculty and students are modeling a scholarship of engagement through mutually beneficial partnerships with East Baton Rouge Parish public schools.

A) Article about Service Learning Class Tutoring Math in Elementary Schools @ LSU

7) Service Learning for Pre-Service Math Teachers:
www.calstate.edu/cce/resource_center/presentations/Math_Sci_Teachers_and_SL.doc

8) Math Teacher Service Learning Training @ California State University Long Beach
In our service-learning program teacher-training candidates bridge the gap between expectations and realities of teaching in the K-8 classroom. In the mathematics training segment of this
program candidates become aware of the creative part of mathematics as well as the importance of the standards that accentuate mathematics instruction in the State of California.

http://findarticles.com/p/articles/mi_hb3325/is_/ai_n29182837

9) Tutoring Kids and Adults in Math @ Georgia College & State University

10) MATH 362S ~ Service Learning & Math Service Learning Lab @ California State U. Monterey Bay
http://math.csumb.edu/?page=mathcourses

Students examine their own and children’s learning of elementary and middle school mathematics. Discussion focuses on issues of equity, diversity, and social justice in the context of mathematics and mathematics learning. The service component of the course may include aiding or tutoring in mathematics classes or facilitating mathematics activities in after-school programs.

Prerequisite(s): MATH 304, 305, 306, 308, or 309; or concurrent enrollment. Co-requisite(s): MATH 362LS.

11) THE COMMUNITY ALGEBRA INITIATIVE @ U. Penn.MATH 122 001; Professor Idris Stovall
https://www.nettercenter.upenn.edu/

This course allows Penn students to teach a series of hands-on activities to 9th grade students in an algebra class at Sayre High School. During the second session of each week, Penn students will teach the hands-on activity to a small group of high school students. The Penn students will also have an opportunity to develop their own activity and to implement it with the high school students as well.

VI. Recommended Books and Journal Articles in Mathematics
Best Resources:


“The service-learning mathematical projects described in the book generally fall into three categories:
1) mathematical modeling in both elementary and advanced mathematics courses,
2) statistics in both introductory and advanced courses, and
3) education-related activated for both pre-service teachers and mathematics majors who do not intend to teach mathematics. Each project is described by the faculty member(s) who facilitated the project. In their summaries the authors illustrate the mathematics used in each project, provide evaluation schemes, and explain how to identify community partners. Furthermore the roles of the students, the faculty member and the community partner are clearly defined. The projects summarized range in mathematical sophistication, but all are equally important and each contributes greatly to the community. As a reader, I found it interesting that service-learning in mathematics is taking place in community colleges as well as research institutions.” (A review of the book by Hortensia Soto-Johnson).
“JAM is a refereed journal devoted to the publication of original research papers and review articles in all areas of applied, computational, and industrial mathematics. Subject areas include (but are not limited to) approximation theory, computing, control and systems, differential equations and dynamical systems, financial mathematics, fluid mechanics and solid mechanics, fractional calculus and its applications, linear and nonlinear waves, numerical algorithms, numerical analysis, operations research, optimization, partial differential equations, probability and stochastic processes, simulation, statistics, wavelets and wavelet transforms.”

These materials come out of a Campus Compact Mini Grant provided to the University of Minnesota, Morris (UMM). Grant Coordinators have developed and implemented ideas and lessons plans that integrate service-learning into Mathematics courses. This packet of materials contains the process of implementation, areas of analysis, UMM course descriptions, course integration and processes, data descriptions, community-based resources, availability and distribution of reports, assessment tools, individual course projects, and questionnaire materials.


Other Great Resources:
Provides examples of how service-learning projects help student understanding of mathematics.


In an attempt to provide instructive models of the design and implementation processes commonly associated with service-learning courses, this publication maps the development of 18 service-learning courses in the SEAMS (Science, Engineering, Architecture, Mathematics, and Computer Science) disciplines at the high school and college levels.

Carr, Kevin. (2002). Building bridges and crossing borders: Using service-learning to overcome cultural barriers to collaboration between science and education departments. School Science and Mathematics, 102 (6), 285-298. This article describes several successful and unsuccessful collaboration efforts between scientists and educators that took place during the creation of an interdepartmental service learning project, Science Outreach, at George Fox University.

Duke, J. (1999). Service-learning: Taking mathematics into the real world. Mathematics Teacher, 92(9), 794-798. The author talks about the potential for service-learning in the secondary and collegiate math classrooms. He discusses the need for careful planning by faculty, students and community participants, and mentions potential service-learning projects such as environmental monitoring and projects in which advanced students tutor less advanced students.


http://www.amstat.org/publications/jse/v15n1/lesser.html


http://www.radicalmath.org/docs/SJMathGuide.pdf


http://www.ourtimes.ca/Between_Times/article_69.php


Wozniak, J. (1996). Mathematics and Science Faculty Service-Learning Handbook. Los Angeles, CA: ERIC Clearinghouse for Community Colleges, 1996. Resources developed by "Campus Compact," a coalition of over 550 colleges and universities established to create and enhance service-learning opportunities for students, are presented in this handbook for mathematics and science faculty. A brief introduction defines service-learning and provides a continuum of types of service-learning, such as one-day fundraising tasks, class related assignments, volunteer tutoring, and paid internships. The first section provides sample documents used in administering programs, including a development form for integrating service-learning into a course, a reasoning objectives matrix, a student application, a learning hour report, and an evaluation form. The next section underscores the importance of reflection in the service-learning process, offering models and guidelines for facilitating reflection among participants. Selected resources are provided in the following section, and a sample analysis of the effects of
tutoring on academic achievement. The final section contains sample syllabi designed to assist instructors who wish to integrate a service learning component into their math and science courses.


V. Recommended Books and Journal Articles in Computer Science
“A "toys for tots" service-learning experience integrated into an industrial technology management course required development and planning using a process planning and costing model and work with a variety of stakeholders including an Even-Start learning center. Challenges include the lack of service-learning precedent in technology studies and the nature of the reflection component” (Learn & Service America’s NSLC’s STEM resource sheet). The International Society for Technology in Education (ISTE) is a source for professional development, knowledge generation, advocacy, and leadership for innovation. From their website you can find K-12 educator resources, including books, journals, and toolkits.”
http://www.iste.org/


“This article introduces technology training designed for university professors who work with preservice and emergency teachers at a College of Education of a state university. The technology training was delivered in multiple ways: (a) large group workshops, (b) small group meetings, (c) individual mentoring, and (d) just-in-time training. Service-learning and reverse mentoring were the highlights of the project; they were used in individual training during which graduate students in the Instructional Technology (IT) program served as mentors to the university professors. Formative evaluation was conducted, and the results were positive. Such training worked well in this Teacher Education program and may benefit other higher education institutions or K-12 schools.”

http://portal.acm.org/citation.cfm?id=961511.961523


The nonprofit sector offers excellent database and software engineering projects for computer science undergraduate students. Collaborations with the nonprofit sector have a greater chance of success, since the nonprofit sector and academia share commonalities: both deliver services, have long-term goals that are difficult to measure, and exist to serve an idealistic purpose - the creation of a better society. By involving students with nonprofit agencies we not only help the nonprofit agency better accomplish its mission, we strengthen student awareness that they can improve society and we encourage a sense of civic duty that we hope will last a lifetime.
http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1158207

“More than 40 percent of Wisconsin's students attend schools in rural communities. Many rural schools face unique challenges, often related to economic need, when planning for the future. The digital divide grant received from the Corporation for National and Community Service offered rural communities a new opportunity to address persistent difficulties. The grant equipped hundreds of young rural leaders with leadership skills and entrepreneurial and technology training. The young people then shared their new skills with their schools and communities, initiating projects to bridge the digital divide. This publication describes the programs developed by the 14 participating districts and the impacts each project made. Some examples are a middle school class that taught a weekly computer class to senior citizens at a local retirement center. Students in a school district received training to become community technology consultants. As part of a 3-year project, they then developed a village website.”