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ABSTRACT

To fulfill a service-learning course requirement at the University of Tennessee, Knoxville (UTK), two science-education doctoral students provided professional development to rural teachers and principals participating in the Appalachian Rural Systemic Initiative (ARSI). This paper begins with descriptions of service learning objectives, both in general and at the university level; the National Science Foundation's development of rural systemic initiatives, and ARSI in particular, to improve math and science education in rural schools through systemic change; and the ARSI model, which is based on a "bottom-up" team approach to school reform. "Teacher-partners" (mentors) designated by their schools as mathematics and science leaders are supported by a district leadership team and by five resource collaboratives located at university sites. As one of these resource collaboratives, UTK provides professional development opportunities to teacher-partners and direct services to their schools. Teacher-partners lead their schools in developing and implementing school improvement plans based on "best practices" and state and national standards. In the service learning project of the UTK resource collaborative, the two doctoral students were involved in training ARSI teacher-partners to use current math and science inquiry methodologies and training ARSI principals to evaluate science educators using inquiry methods. The details of these trainings are presented, followed by reflections of the two trainers on their experiences and the project's value. (Contains 12 references.) (SV)

Appalachian Rural Systemic Initiative: An Account of a Service Learning Collaboration of Two Science Educators

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INTRODUCTION

This paper was collaboratively written by two science education doctoral students and describes a common service learning project resulting from our participation in a Cultural Studies course at the University of Tennessee. At times, the reader will 'hear' two distinct perspectives and voices; however, the service-learning project is shared. One of us, Terry Lashley, is a practitioner and part-time doctoral student who heads UTK's office of the Appalachian Rural Systemic Initiative (the office at which the two authors collaborated). She acted in a dual role of participant and supervisor of the other participant. The other author, Sherri Brown, is a full-time doctoral student who is also a teacher and was a true practitioner-participant in the service-learning project.

In a course based upon cultural studies and service learning, we, as two science education doctoral students were given the opportunity to have open collaborative, small group discussions concerning the various theories underlying cultural studies. Even though we both had a science education background, we had not met prior to enrolling in the course. During the first week, the course instructor asked students to identify a project/community organization of interest to them. The students could complete the service learning experience either individually, in pairs, or in small groups. This was the first university course exposure to service learning for us both. We selected the ARSI organization due to a mutual background and interest in science education of underserved rural areas. After exchanging phone numbers and emails, the authors immediately began

to collaboratively work with the UTK Resource Collaborative-Appalachian Rural Systemic Initiative (ARSI) service-learning project.

SERVICE LEARNING

Before describing the ARSI organization and the work we each did, a further conceptual development of service learning is required. The version of service learning taught in the course, service learning for social justice, involves an awareness and engagement of social differences such as race, class, gender, and regionalisms, in exercises of 'real-world' practice. From involvement with service learning and immersion within the field, students are given the opportunity to actively address social justice issues in concrete situations. While this model of service learning was incorporated with cultural studies theory and politics (which overlap with service learning for social justice), our focus in this paper is on the service learning theory and activity.

Begun in the 1960s, service learning is a special form of community service designed to promote student learning and development (Gray, Ondaatje, & Zakaras, 1999). One of the earliest definitions of service learning is that it is the "accomplishment of tasks that meet genuine human needs in combination with consciousness education growth" (Stanton, Giles, & Cruz, 1999, p. 2). Service learning now evokes the concept of reciprocity between the server and the served (Stanton et al.). A liberal arts education stresses public service by developing civic literacy for students by having the students work in and have an opportunity to make a real impact on the community (Stanton et al.). Additionally, colleges are careful not to assume that service emerges spontaneously as a

result of a college education (Wutzdorff & Giles, 1997). Service learning in higher education goes "beyond charity and volunteerism to include meaningful action accompanied by critical reflection about social issues" (Wutzdorff & Giles, p. 107). Indeed "Service Learning is a philosophy and methodology involving the application of academic skills to solving real-life problems in the community" (Pate, 1999, p.1). The results and impact of service learning on students include enhanced responsibility, reduced stereotypical views, and developed empathy. Students with service-learning experience "had more structurally sophisticated views of social problems and solutions to these problems than [those] with little or no service-learning experience" (Wutzdorff & Giles, p. 112).

Service learning, as defined under the large southeastern university guidelines, strives for a "development of a shared understanding [of service learning among] departments, disciplines, schools and divisions of the University [within] a geographic community" (Gregg, 1998). This shared understanding of service learning "combines three pedagogical functional components: classroom study, service activity related to the course content, and structured reflection on the service activity" (Gregg, p.3). These three functional components are aligned with the National Society for Internships and Experiential Education (NIEE,) [of the ten "Principles of Good Practice for Combining Service and Learning"] (Gregg, p.3).

The specific objectives of the university's service learning opportunities are to "connect theory and practice, integrate learning across disciplines, apply knowledge, learn how to learn, experience difference and develop new skills" (Gregg, 1998, p. 5). The rationale for providing a service-learning component to the university curriculum has

been supported by Fisher (1997) and Mathews (1997). Fisher proposed service learning as an avenue in fostering "citizens who are prepared to build community and work for the common good." Fisher eloquently stated that "citizens are not born, they are made" (p.2). Mathews spoke to public scholarship, "which consists of those things that we can know only when we are together and never alone" (p.73). Mathews (1997) argued for social construction of knowledge whereupon public spaces are utilized in generating practical wisdom.

APPALACHIAN RURAL SYSTEMIC INITIATIVE (ARSI)

The Context of ARSI Within The Cultural Studies Service Learning Project

Due to a number of national studies showing unacceptable student performance in mathematics and science, the National Science Foundation (NSF), in the middle 1980's, began a set of state initiatives to improve student achievement in mathematics, science and technology education through systemic reform. These were called Statewide Systemic Initiatives (SSI). A few years later, in order to address the low levels of mathematics and science performance in certain schools in urban areas, NSF established Urban Systemic Initiatives (USI). These initiatives particularly addressed the high poverty school districts.

In the spring of 1993 the Educational Systemic Reform (ESR) program of NSF and what ultimately became the leadership of ARSI held discussions regarding the development of a similar initiative for economically disadvantaged rural counties in central Appalachia. At that time, four of the central Appalachian states were recipients of SSIs, namely Kentucky, North Carolina, Ohio, and Virginia. The result of the

discussions with ESR led to establishing a consortium of leaders from six central Appalachian states (Kentucky, North Carolina, Ohio, Tennessee, Virginia, and West Virginia), the Appalachian Educational Laboratory (AEL), Eisenhower Mathematics & Science Consortium and the Kentucky Science & Technology Corporation to plan a conference to assist NSF as it developed its plans for a possible "Rural Systemic Initiative (RSI)" program in understanding the systemic approach to education reform.

A conference supported by NSF on "Systemic Change and its Significance for Mathematics and Science Education in Rural Schools" was held October 21-23, 1993, in Huntington, West Virginia. As a result of that conference, NSF decided to launch the RSI program and invited the Consortium responsible for the Conference to submit a developmental award proposal (planning grant) which would, if granted, provide the Consortium funding to prepare an implementation grant proposal to "improve the scientific and mathematical literacy and achievement of all students in rural economically disadvantaged regions with 30% or greater of school-aged children living in poverty" (National Science Foundation, 1994, p.68).

In developing the implementation proposal, the Consortium established study groups consisting of educators, business and civic leaders, and citizens from six states to collect data and information at local and state levels and make recommendations that would enhance educational opportunities in the Appalachian rural counties. The results of the research highlighted a need for (1) a localized vision for improvement, (2) the enhanced capacity to build on available resources, (3) access to new technology information and material and (4) the need to build a more competitive workforce through

better student performance in mathematics, science and technology, which is a vital step in resolving many of the problems facing Appalachia.

The Consortium submitted a proposal entitled Appalachian Rural Systemic Initiative (ARSI), which was funded by NSF beginning in September 1995 in the amount of $10 million. Its goals were (a) to develop the skills of K-12 teachers so that they can use technology to teach mathematics and science more effectively and all students can participate fully in the technological society; (b) to establish a timely coordinated system for making the necessary resources and services available; (c) to build regional partnerships in local communities to support and sustain educational improvements; (d) to fuel the educational and economic growth of the region by linking advances in technology with each community's commitment to build a better future for its children.

During its first year, ARSI made assessments of the school district's technology, instructional needs and the level of community involvement. These results were used to design and schedule technical assistance, professional development and specific activities, which would most effectively impact the community's need. Resource Collaboratives were established to overcome geographic isolation and lack of resources. These were located at higher education institutions, namely The University of Tennessee, the University of Kentucky, Marshall University, Ohio University and Clinch Valley College (now the University of Virginia's College at Wise). As a customer-driven network of partners their mission was to empower educators in the community to improve and sustain performance in mathematics, science and technology education.

A site visit from NSF in the second year resulted in refocusing the program's central emphasis and energy from technology criteria and training to the prime criteria of

standards-based Mathematics and Science Education reform. A new Project Director whose expertise included statewide reform was appointed to implement the new direction.

ARSI Model

The Appalachian Rural Systemic Initiative (ARSI) is making a major contribution to education reform through the implementation of a truly systemic school and district improvement model. Improved student achievement is being realized as ARSI focuses on K-12 students through the development and support of catalyst schools designed to serve as models for other schools in their district. The resulting catalyst districts serve as leaders for reform efforts throughout the region.

The ARSI model is based on a "bottom-up" team approach to school reform. A key component of the model is the development of Teacher Partners (mentors), who are designated by their schools as mathematics and science leaders. A team of professionals (Leadership Team) at the school building and district level including the building principal, ARSI district liaison, and district superintendent supports the Teacher Partner's work. External support for the Teacher Partners and the development of catalyst schools and districts come from five Resource Collaboratives located at university sites specialists who, with support from university mathematics and science educators, provide professional development opportunities and training for Teacher Partners, and direct services to catalyst schools in their region. Each catalyst school, led by the Teacher Partner, develops its own school improvement plan based on needs assessments, data analysis and assessment of the instructional program.

Implementation of the ARSI model has proven to be effective in providing direction for school reform and as a mechanism for technical assistance to catalyst schools. ARSI has provided assistance through the development of school leadership, access to national and regional resources that support mathematics, science, technology reform efforts and improvement of the community support base. ARSI has made a major contribution through the development of standards-based curricula, science/mathematics content and pedagogy development workshops for teachers, and identification of high quality instructional resources, while providing extensive support for the key ingredient of the ARSI model, the Teacher Partner.

One of the tools used for assessing program improvement needs has been the Science and Mathematics Program Improvement Review. This instrument is used to assess the program's effectiveness against a set of standards developed around "best practices," which are consistent with state and national mathematics and science standards. Needs assessment data gathered through this process have been utilized in both school and district strategic planning efforts.

SERVICE LEARNING AT ARSI

As noted in the introduction, the authors' involvements with ARSI are from two perspectives – Sherri Brown's from a "practitioner participant" perspective and Terry Lashley's from a "practitioner leader" perspective. While Sherri's collaboration with ARSI was temporary (lasting a semester), Terry's involvement is ongoing through her leadership work with the University of Tennessee's ARSI Resource Collaborative.

ARSI Participation and Service Learning: Sherri Brown's Account

My principal role in ARSI involved participation in major ARSI events on seven different dates in the Fall of 1999: September 16, September 17, October 11, October 20, November 3, November 5, and November 19. The first four dates were seminars offered to rural area ARSI teacher partners for training in current math and science inquiry methodologies. Rural area principals attended the November 3rd data to learn how to evaluate science educators using inquiry methods. The November 5th meeting was an informal meeting at the main office to perform managerial duties. The November 19th date was the Tennessee Science Teacher Association conference; ARSI teacher partners attended, while, and ARSI leaders presented. Times of interaction with the ARSI cohort ranged from three to eight hours in length at various locations, which included the conference center at UTK, the faculty club at UTK, an elementary school in Maryville, TN and Whitley County Middle School in Williamsburg, KY, and the airport conference center in Nashville, TN.

ARSI conducted the meeting of September 16, 1999 at a university conference center. After a complementary breakfast, the ARSI Curriculum Specialist shared opportunities available to the Kentucky ARSI Teacher Partners. One opportunity was paid attendance to the upcoming NCTM conference in Chicago; additional contact person names were provided. Attendance positions were available for University of Tennessee (UT) at Martin Technology for Careers with Educational Edge. The UT Martin opportunity included perks such as cash, curriculum materials, and fifteen free graphing calculators. Lastly, End of Course Gateway Training Conference and 70% reduced Silver Burdett book sales were upcoming opportunities discussed.

Announcements targeting ARSI organizational requirements, such as the "Golden Nuggets" and "Quarterly Reports," were reported. The "Golden Nugget" was a data collection form detailing how the Teacher Partner implemented an ARSI intervention in their classroom. The form asked for information detailing number of students, accomplishment, resources, and academic outcomes. Attachments of student work were also required. Lastly, racial and gender equity issues were discussed. The submitted information included in the "Quarterly Report" for the UT Resource Collaborative detailed ARSI progress on established benchmarks, event listings, and numbers attending event.

After the announcements, an educational NASA representative was introduced. He disseminated posters, stickers, and curriculum activity books. After demonstrating some of the activities from the activity book, he gave valuable information about educational camps and opportunities that NASA provides. Additionally, he provided participants the URLs of numerous web sites and official contact names for programs and materials. Finally, he discussed upcoming science teacher and student opportunities and organizations, such as the Civil Air Patrol, Aviation Day, Goodyear Blimp, Moon Buggy Contest, and Earth Camp.

The following day the conference was held at the university faculty club. A math teacher from Karns Middle School, Knoxville, TN, distributed manuals of math activities along with TI calculators, decks of playing cards, and cube and disc manipulatives. The 12-person cohort group watched and participated with each other as the instructor guided the group through the activities. Methods of modifying activities for age and class appropriateness were discussed.

Subsequent involvement with ARSI was at an elementary school in Maryville, TN, on October 11, 1998. Traveling experts in the field of mathematical instruction addressed math assessment and objectives. Authenticating mathematical experiences was a major facet presented to the group of math practitioners from the Eastern Tennessee area. A few science teachers attended the session as well.

A visit to Whitley County Middle School in Williamsburg, KY, on October 20 was the final Teacher Partner Meeting interaction. The meeting began as usual concerning ARSI business about upcoming available opportunities to the Teacher Partners. Following the announcements, Gail Radford, a full-time ARSI Teacher Partner, guided the group in elementary (Grade 5-8) based activities concerning inquiry-based science. Radford distributed folders and handouts from the book *Rising to the Challenge – Process of Science Inquiry* by Karen Ostland and Cheryl Mercier. The activities included observing, classifying, inferring, measuring and communicating about the various shells on the tables. NSTA Pathways books were distributed for elementary, middle and high school level.

Kathy Lyon led the afternoon session on "Science Inquiry." Three stations were constructed and labeled as follows: exploratory station, guided station, and challenge station. Each station contained selected items that could be utilized in making foam. These items included eggs, shaving cream, cream of tartar, root beer, dishwashing detergent, eggbeaters, electric beaters, bowls, plates, and measuring cups. The Teacher Partners worked in groups to make a type of foam. The groups were to build towers using the foam and then collect data about the foam. The final portion of the session involved the explaining the methods of the various stations. The Teacher Partners were

to demonstrate how they could incorporate this real inquiry-based science activity into their classroom.

The November 3, 1999 conference, "Leadership for Improving Science Instruction," was conducted for all ARSI principals. The university club workshop was attended by nine principals, which represented Claiborne, Cocke, Fentress, Hancock County, TN; Wise and Lee County, VA; and Graham County, NC. Principals from the same county represented different schools at elementary, middle, and high school levels. ARSI leaders included Terry Lashley, Director of ARSI Resource Collaborative and Dr. Stephen A. Henderson, ARSI Central in Lexington.

The workshop opened with breakfast and brief introductions. The "practitioner participant" was introduced as a science education doctoral student from the university. A packet of materials was distributed containing the agenda, ARSI data, National Science Education Standards and research articles on science inquiry. The goal of the training seminar was to facilitate principals in evaluating science practitioners with a specific focus on the evaluation of teachers who use inquiry methods of instruction. The meeting offered an overview of the Framework for Quality Science Instruction, which included a Vision of a Quality Science Instructional Program, Science Program Improvement Review Process and Standards, National Standards for Science Education and Curriculum Implications for School Administrators.

After the overview, Dr. Henderson divided the class into three groups to participate in an inquiry project based upon a real-life scenario. The group participation explicitly showed principals the details of inquiry-based instruction. The inquiry problem involved construction of several hypotheses concerning an event that occurred on an

interstate bridge in Kentucky. Apparently, during construction of a bridge, a crane became unbalanced while lifting a heavy load; the crane was pulled forward and teetered on the edge of the bridge. Dr. Henderson provided local newspaper articles, which covered the remarkable story. Materials for reconstructing and testing our hypotheses were also provided. Each group made a presentation of their hypotheses, and after each hypothesis, a classroom discussion erupted.

After all of the presentations, the groups pieced together a pie, which included Bloom's taxonomy of learning theories. Two groups placed the pie pieces in the questioning order from evaluative, to analysis, to recall. Upon completing the representations, the principals were presented with additional information regarding evaluation of teachers. After watching video of a practitioner's classroom activities, the principals had the opportunity to utilize the learned information regarding evaluation. The principals scored portions of the video using a rubric. Upon completion of the scores, the principals discussed observable aspects of effective scientific instruction.

None of these principals had a science background, as their backgrounds varied from English, History, Art to Physical Education. During the video presentation, one of the principals stated as an aside comment that they "did not know how inquiry techniques could be effectively used in the middle school." Overall, few negative comments were stated concerning inquiry-based instruction. Dr. Henderson expressed the desire for the principals to encourage the science faculty to attempt one inquiry-based lesson per month in order to acclimate to the process. The principals agreed with the implementation of this goal.

On November 5, 1999, participation with ARSI consisted of an introduction to the ARSI staff, housed at Suite 312 in the University of Tennessee Conference Center. The ARSI staff is small, consisting of a Resource Collaborative Director, a Curriculum Specialist, and an administrative assistant. Work Study students from the university perform basic office tasks such as filing, delivering, sorting, and copying. That particular day involved assisting the Work Study students in organizing, copying and collating materials for the Gateway Institute. Kathy Lyon, an Independent Science Consultant, discussed her inquiry instructor training from the Exploratorium in San Francicso, CA, and how she utilized this training to coordinate materials and methods to instruct inquiry-based methods to the ARSI Teacher Partners.

Final involvement with ARSI was during the attendance of the Tennessee Science Teachers Association (TSTA) convention in Nashville, TN on November 19, 1999. Several ARSI presenters covered a variety of topics, which included titles: K-5 Making Science a Family Affair; K-12 Conduits to the Classroom – The Critical Role of the Point of Contact; K-5 Space Trek-2000 An ARSI Voyage and Grant Writing. Additionally, ARSI individuals assisted Dr. Al Hazari's chemical presentations. Activities, such as moon rock classification and star diagrams, were distributed during the ARSI space voyage. Dr. Hazari and Kathy Lyon demonstrated and distributed samples of liquid rubber, which solidified upon air contact, and Crayola markers that tested pH. The details of each session were endless; however, each session had a commonality in that all were demonstrating effective tools for science instruction.

ARSI Participation and Service Learning: Terry Lashley's Account

The "Practitioner-Leader" experience with a service learning project was actually real work with fifteen school systems in Eastern Tennessee, Southern Kentucky and Western North Carolina. The University of Tennessee-based position requires having a thorough knowledge and understanding of individual school needs, community resources, appropriate opportunities and individual personalities of institutions and people. Part of the work involves building professional relationships as well as trust between the Resource Collaborative and the ARSI communities.

The Resource Collaborative Director position involves providing direct services to the districts enabling them to receive an objective analysis of their current status in mathematics and science instruction. Responsibilities also include coordinating monthly meetings for Teacher Partners (who are either mathematics or science teachers and teachers of all levels elementary, middle or high school) which are both appropriate and valuable to them in the professional work. Furthermore, the RC Director is responsible for facilitating community engagement activities within the individual districts. Often I help to provide resources and/or mentoring for individual teacher growth either in mathematics or science content, teaching pedagogy, and leadership. This involves the ability to assess individual district and teacher needs, coordinate professional development, navigate through three different state science and mathematics frameworks, and more. The strategies employed by the University of Tennessee Resource Collaborative, in fact by all of Resource Collaboratives, are varied as we respond to the relative readiness of districts to engage in and support their own local reform efforts. The external evaluator (from Inverness Research Associates) commented that there is a kind

of Maslowvian hierarchy of educational survival, improvement, and enlightenment in the various districts. And, because the districts are at different "reform" levels, they view and use ARSI in different ways, and ARSI in response, has learned how to provide different types of services and support.

Several years ago, Dr. Jesse White, Federal Co-Chairman for the Appalachian Regional Commission (ARC) stated that too many opportunities were bypassing the people of the Appalachian region. Dr. White indicated that just as the interstate highways had further isolated many Appalachian people; technology, educational improvements and economic development were also bypassing these communities. My belief is that this "bypassing" is a major challenge for the Appalachian people and emphasizes the problem of equity and access. I do not believe that being poor or isolated equals lack of intelligence. I do believe that having information and access to resources is critical for improvement and it is my personal goal to insure that the districts I serve receive them.

I work toward the ARSI goal of providing assistance to over eight of the poorest school districts in Appalachia. In doing this work ARSI has created a model utilizing a common broad strategy for working with each of its districts. The model employed is aligned with the town-gown collaboration position taken by the Rev. Robert Castle in the Benson and Harkavy (Benson and Harkavy, 1997). That is, the university-based ARSI Resource Collaborative seeks to impact the well-being of the neighboring communities in ways that (also) helps the university realize its basic educational and research goals. It is my responsibility to act as a service agent, providing professional support and brokering access to other professional development providers and instructional materials. It is also my responsibility to work with school leadership in a similar fashion. And, as ARSI

participation is voluntary, I seek to nurture ongoing partnerships with districts and encourage and support new districts as they begin their work with the ARSI.

REFLECTION ON WORK WITH ARSI

Service Learning Reflection: Sherri Brown's Account

As with involvement in any direct experience, whether titled an apprenticeship, field or service-learning experience, a major learning component is reflection. Service learning is a "combination of the performance of a useful service for society and the disciplined interpretation of that experience for an increase in knowledge and in understanding one's self" (Wutzdorff & Giles, 1997, p.107). Reflection is done formatively at the end of each individual experience and summatively at the end of the entire experience.

My initial reflection on the ARSI service learning experience was somewhat misguided due to my assumption that my participation had had no impact whatsoever on ARSI or other participants. This assessment was due in large part to my acute awareness of my outsider status as a doctoral student from the ivory tower. On the other hand, it was also due to my own self image- I am small of stature and my personality is one of a demure, non-assertive, easygoing attentive and cordial woman. From discussions with ARSI staff members, however, I discovered that even though I saw myself as both the ivory-tower outsider and the unobtrusive, unassertive woman, my participation did in fact have an impact. My current reflection is one of embarrassment from my naivety in not realizing that my participation had elicited an effect. Currently my reflection includes how the Teacher Partners could have felt threatened by "little ole me." My reflection

also included my secondary teaching experience, which was very different from the ARSI Teacher Partners' experiences. My science teaching experience included vast amounts of money and resources for tools to conduct inquiry-based science instruction. Additionally, opportunities for national conference attendance were readily available from my affluent school district. It was a novel and enlightening experience to see practitioners teaching without these available resources

My childhood upbringing was in a rural Appalachian area that qualifies as one of ARSI's areas for assistance. This particular rural area was always shockingly underrepresented at the ARSI functions. Once selected as an ARSI qualifying area, participation by the schools is on a voluntary basis; my hometown area chooses not to affiliate with ARSI. Most of my relatives have spent their entire lives within ten miles of their birthplace; therefore, my relatives have an understandable fear and dislike of outsiders. My rural Appalachian relatives are fearful of driving on a four-lane highway and of going more than a few miles from home. During family occasions, my relatives ask me medical questions because of my work on a "doctoral degree." I believe many of the communities ARSI serves are composed of people just like my relatives and these characteristics and attitudes need to be taken strongly into account in the work of projects like ARSI.

As a future teacher educator, my objectives are to instill a sense of community service learning within my preservice teacher's practice. My teacher preparation coursework will include experiential learning of service learning techniques by affording the preservice teachers opportunities to develop and implement service learning experiences in their school placement. Additionally, my courses will attempt to tackle

some of the real barriers for service learning implementation that Scales and Koppleman (1997) reported. These barriers were "lack of time for working with community resources, insufficient block scheduling to accommodate service learning program needs, the absence of supportive policies and resources for students and teachers, and inadequate school and community support for the learning that students might acquire from nontraditional programs" (p.126).

Reflecting on my ARSI experiences and my own rural family, I've come to believe firmly that services must address specific community needs and also must be of value to the server. Reflection and communication are key elements that must be present for growth in service learning. Involvement with ARSI as a university service-learning project was initiated from a single expression of interest. After that initial expression of interest, invitations to all meetings involving the Teacher Partners of math and science were received. From my perspective, the Teacher Partner cohort was extremely generous, pleasant, and accepting of my involvement. Overall, the experience was positive and valuable in that the rural teachers expressed their "true needs and concerns." From my perspective, ARSI's intervention within these rural areas was very encouraging, as it attempts to combat the economical, social, and environmental discrepancies.

Service Learning Reflection: Terry Lashley's Account

My reflection on this service-learning experience provides the opportunity to reflect on my work. And, as I reflect, I find a true personal value in my work with ARSI and the realization that it isn't 'just a job.' My work enables me to utilize my professional networks and knowledge to bring previously unknown opportunities to teachers who really need and want the assistance. It is rewarding to see the individual

teacher growth and accomplishment and, of course, to see students having increased opportunities in science and mathematics. Having personally experienced similar opportunities in my early teaching career days, I know the potential of this project and hope that teachers will take full advantage of everything provided. I am also fully aware that the project can't address all needs for everyone and that we often come short of fulfilling the district needs.

My reflection also helps me to re-focus on the need for this project and the students who will ultimately benefit from ARSI. However, I also wonder what will be (can be) sustained beyond federal funding and external assistance. Am I really helping to bring about "systemic" change or is this a project, which will come and go with the grant monies? Are we really building capacity and leadership? These are all serious questions for me and because I have been involved with numerous other "projects" I am aware that some improvements will remain, but other improvements will, in time, fall away.

My roots are rural and my upbringing was not unlike what is found in rural Appalachia. I feel fortunate to have grown up in a very small farming community with a population of just over 600 people. And I concur with Rowley (1996) when he notes that "both pro-rural and anti-urban values are persistent and powerful in American myth, reality, and political and social discourse:"

> For many people, rurality connotes intrinsic value. That value can be positive, as expressed by such rural descriptions as pastoral, bucolic, and untamed. It can be negative, as in desolate, backward, and isolated. These values have developed throughout the nation's history and are expressed in its literature, art, music, popular culture, political opinion, and residential preferences. Furthermore, Americans value rurality for what it is, what it is not, and what they believe it is or is not (p.3)

I never considered living in a rural community or attending (and graduating) from a small high school as a negative. I valued the community and people, the school's small classes and individual attention; in fact, I believe I received an excellent education. I also believe the community was supportive of youth, in general, and me as an individual. Although my school was located over 50 miles away from a town of any size, my teachers attended to quality. They were active in educational organizations and participated in Institutes and Academies to improve themselves professionally. They were true leaders in the community. I hope I bring this vision of "intrinsic value" to my work with ARSI—and the fact that there are many more positives than negatives to rural life. On the other side of this argument is that opportunities are limited, resources are fewer and access is limited. Improved opportunities, resources and access are attainable. That is where I see ARSI making a difference.

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