A Portrait of an ARSI Teacher Partner in Oneida, Tennessee

by Elizabeth Horsch and Barbara Heenan

The August 8, 2002 edition of the "Scott County News," a weekly newspaper published in Oneida, Tennessee, features a front page article on Arlenia West. "88-Year-Old Arlenia (Arleny) West Named 2002 Farmer of the Year," reads the headline. In a photograph accompanying the article is a picture of Arleny. Her gray hair is pinned back in a small bun and she is wearing a print dress and comfortable, moccasin-style shoes. She has both hands placed on her cane, and she is smiling broadly. In another picture we see her standing in her famous sweet potato patch well known throughout the county. It's a patch of an unusual white variety of sweet potato started from slips her uncle gave her in 1935 and that she has maintained ever since.

Two years later, Arleny West and Barbara Shoemaker, the ARSI Teacher Partner from Oneida, sit on the sunny front porch of Arleny's tiny cabin, chatting about Arleny's early years in this remote Tennessee area. Arleny has lived on her farm since she settled there with her husband in the early 1930s. She lives alone now and farms her small place with little or no help. Barbara is a former secondary mathematics and science teacher whose husband also has his roots in this county. When Barbara asks about Arleny about early life in Oneida, she paints a revealing picture of growing up in this rugged, rural environment:

> *Alright, when we growed up it was a big family, there were 13 in all… We were raised on the farm, that is how we got our doing, selling stuff, butter and milk and eggs and things like that. And with a big family you had a hard time keeping us all something to wear. We always just had one dress in the summer time to wear when we went anywhere… .*
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> *Wasn't no cars or nothing going then. The road was so bad you could hardly walk through. You had to get up on the bank where you could walk out of the mud… You ask about going to school… there wasn't no way of going but walking then. The big snows would come and we would walk, get out and lay down in it and make prints on the way to school. Yeah, we had books. We had arithmetic and spellers and geography, I don't believe they call it geography no*

more, something else, but we had all of those just like they do now… I was in 8th grade when I quit. [1]

When their conversation scrolls forward to her life now, Arleny tells about digging 5 bushels of her famous sweet potatoes the day before. Barbara is incredulous. "You dug 5 bushels all by yourself?" Arleny responds:

I did. They might say they helping me a lot, but I cut that corn all up by myself. Nobody knowed I was cutting corn, nobody never offered help and then when it come time to gather it, they know and nobody showed up. I gathered all that corn…

There is a strong sense of kinship between Barbara and Arleny. Separated by generations, they are linked by a fierce independence, a relentless determination to achieve, and a mutual tie to this region of Tennessee. Barbara speaks of admiration for Arleny and her influence:

Arleny is fascinating. She is an independent, intelligent woman without any education. Even though she's had a stroke she is still cutting her hay by hand. She is just so dynamic. I've always liked people like that, I've been drawn to her. To me Arleny is really what this whole area is all about. She represents what Scott County was built on…

This is the story of Barbara Shoemaker and her work as an ARSI Teacher Partner in Oneida, Tennessee. It is the story of what she values and the experiences that shaped her approach to education. In particular it is about what she learned from her experience with the Appalachian Rural Systemic Initiative, and how she passed on those lessons to other teacher leaders in Appalachia.

We have chosen to tell her story because it illuminates the ways in which ARSI invested in individual teachers, and how, in turn, those individuals contributed to the overall leadership capacity and improvement infrastructure for mathematics and science education in Appalachia.

[1] We taped and transcribed interviews from the ARSI educational leaders and other interviewees presented in this report. The quotes we used are not always literal, direct quotes. Rather, we have at times used our best judgment to edit them lightly to either make them more readable, or to convey more accurately the intention of the remarks.

The Beginning:
Teaching in Oneida Special School District

Oneida, with a population of roughly 3000 (and 18,000 in the county), is about an hour north of Knoxville, and just a little further north from Huntsville, the county seat of Scott County. "Scott County must be one of the most historically unusual counties in the United States. The original settlers were veterans of the American Revolution who were awarded grants of land on the Cumberland Plateau as reward for their service. This detail is not quite so unusual as the remarkable fact that when the Civil War erupted and Tennessee seceded from the Union, the leaders of Scott County acted to secede from Tennessee! Perhaps this history accounts in some measure for the maverick status of the Oneida Special School District.[2] In 1915 a bill was passed in the Tennessee state senate establishing an independent Oneida school district within Scott County, and opening enrollment to "eligible students across all of Scott County."

Today the Oneida schools are known for the performance of their students on state achievement tests. The Oneida School District ranks among the top school districts in the state and parents from outside the district boundaries bring their children to its schools because of its reputation for student achievement. Although it is funded by the county, as well as through a special tax on the residents of the school district, it also receives thousands of dollars each year from a local industrialist-philanthropist whose gifts are deliberately aimed to serve as an incentive for the improvement of the district's student test scores.

Barbara Shoemaker began teaching at Oneida Middle School in 1991. Previously she had run a successful landscaping business, but she decided to try teaching so that she might have more time to spend with her young family. As a new teacher she developed a reputation for her energy and for her outspokenness about education and how students learn. She became known as "Have Class – Will Travel" because of her passion for outdoor education, and her insistence on taking her students, out of the classroom and into the community for field trips and other kinds of educational experiences. "We went all over, every year, because I wanted the kids to see what all was out there."

Barbara had only been teaching 4 years when she became involved in ARSI.

> *The way I got into the ARSI program was kind of funny. I am learning now though that it's not an unusual story around ARSI school districts. Before ARSI, when the Appalachian Educational Lab offered programs on math standards, I*

[2] Craig B. Howley and Harmon L. Horbart, Community as Tacit Curriculum: A Case Study of Oneida High School, Oneida, Tennessee (Charleston, WV: AEL, Inc., 2000), p. 61

*had volunteered to go… that meant that when the envelope from ARSI came (*to the school*) with the word Appalachian on it, they thought it was the same thing and they gave it to me. So I attended the first ARSI meeting, and that is how I became the ARSI teacher partner in Oneida. That is par for the course in the way teachers are chosen for these events.*

ARSI was one of the few professional development opportunities that Barbara had ever had. She recalls it as a dramatic break from the bleak professional landscape which she had experienced. Barbara explained:

When you start teaching in a small school, in a small area especially, there's a lot for everyone to do. I was an 8th grade science teacher, a 9th grade science teacher… I taught physical science, and also taught 7th grade math. And I was also the chairperson of the science fair, summer enrichment, homebound teacher. So there were a lot of hats you wore and you didn't have time for anything professional. You really don't. I had no professional growth, other than what I would get during the summer

Just prior to becoming the ARSI Teacher Partner Barbara Shoemaker had been asked by the supervisor of instruction in the district to become involved in some curriculum work. It whetted her appetite for more professional development.

You know actually, that was the first time I think I ever was involved in any curriculum. Up until that point, I had never had any training or any idea of what curriculum was. Then, I started working with the Appalachian Educational Lab because I chose their workshops. They were doing workshops across the region on the national standards and I went to a couple in Nashville -- I was enthralled with the activities. Coming to education with my background, I saw more need for application. Students needed to do more than sit down with a book. I saw a need for students to try to figure it out for themselves. And so that was one thing that really intrigued me – the national standards--that specifically addressed that kind of learning…

The ARSI Years:
The Key Features of the Teacher Partner Program

The development of local leadership capacity for the improvement of mathematics and science education was a major goal of the Appalachian Rural Systemic Initiative. The most important strategy the initiative devised to achieve this goal was the Teacher Partner component, whereby ARSI identified and supported one or two classroom teachers, or Teacher Partners, in each of the ARSI districts over the duration of the grant. The program ARSI offered its cadre of new teacher leaders was designed deliberately to expand the leadership capacities of each individual, and to foster their work with other teachers.

The following section describes the key design features of the ARSI Teacher Partner program and how these features contributed to Barbara Shoemaker's personal and professional growth. Her particular experience serves to illustrate how ARSI's "theory of action" played out across the ARSI districts and for many of the ARSI Teacher Partners. Moreover, her reactions to and experiences with the ARSI Teacher Partner program foreshadow the lessons she learned and then applied as a leader of mathematics and science improvement in the Appalachia as she moved on in her professional pursuits.

Leaving Home to Gain a New Perspective

Paradoxically, to promote local leadership ARSI designed ongoing events for Teacher Partners (TPs) *away* from their local schools and districts. For most of the duration of ARSI, Barbara Shoemaker traveled once a month to Prestonburg, Kentucky, and other sites for two days of meetings. Although it was difficult to leave her classroom in the first year when she was still released only half time, there was value in leaving Oneida to spend time with other TPs from all over Appalachia. Leaving her own district and comparing it to other places allowed her to develop a different perspective on teaching, and, according to Barbara, to find her own way as a teacher. ARSI endowed her with the intellectual tools to shape her own vision for improving teaching in her classroom and her school, and bolstered her confidence to implement her evolving vision.

As a new ARSI Teacher Partner, Barbara was trying to figure out new ways of designing her classroom to provide better instruction to her students, trying to do things differently. Her quest was not easy. She often felt herself outside of the mainstream of teaching in Oneida.

Yes, I felt some anxiety and some isolation. You know, questioning yourself and wondering. I have always struggled with that, all my 14 years of teaching. I was always a little bit on the outside of the main kind of deal. What I mean is, there were always those teachers who were the chosen teachers, who taught in the old fashion way, and had been doing it for years. And if you were not that person, you weren't a good teacher.

Gaining Access to National Reform and Emerging Issues

ARSI provided the Teacher Partners with opportunities to meet with national leaders in mathematics and science education, and to participate in a variety of national level programs and events. ARSI opened the door for the TPs, exposing them to a national reform scene that few of them knew existed. They listened to speakers; they attended national and state conferences; they visited exemplary schools and districts; and they participated in professional development especially designed for teacher leaders in mathematics and science education.

One highlight of these kinds of experiences for Barbara was the educational tapes which ARSI provided each month. She describes the impact of listening to the tapes in her car, traveling back and forth to work, in this way:

They were just different tapes on various topics in education, but it was an eye-opening experience for me… I became aware of all the different strategies out there and the different research, and so I became really interesting in what was happening in education. They were wonderful.

Barbara added, thinking back on her experience, "But I don't think that kind of excitement is really normal for teachers."

Acquiring and Applying New Skills and Knowledge

In contrast to the meager professional development offerings back home in Oneida, the ARSI Teacher Partners were exposed to a great variety of new ideas, skills, and people in their monthly meetings. ARSI challenged them to take these new ideas back home to their own schools and districts.

State and National Standards

Learning about state and national standards in mathematics and science education at ARSI meetings proved to be especially important to the Teacher Partners. Barbara said, "Just becoming aware of the standards was important for us, because a lot of schools didn't know about them."

Developing familiarity with and knowledge of, as well as learning effective strategies for teaching others about them became a useful tool for the Teacher Partners. The TPs' initial presentations on the standards to their administrators and other classroom teachers served as good entrées for further, deeper discussions about curriculum and instructional strategies in mathematics and science.

To begin her ARSI work Barbara used the national standards to structure conversations about teaching with the teachers in the Oneida schools. She explained that many teachers were not aware of national standards and often they were unfamiliar with the state standards as well. She enlisted Steve Henderson who was director of a school cooperative housed at the University of Kentucky to help her define the national and state standards for each grade level, and then she worked with the teachers in her school to help them align what they were teaching with the standards.

Inquiry and Constructivism

ARSI also introduced the Teacher Partners to inquiry and constructivism, the philosophical and pedagogical "big ideas" that underpinned the new curriculum and instructional programs aligned with the national standards. Many Teacher Partners, like Barbara Shoemaker, heard about these seminal ideas for the first time through ARSI. For her, inquiry hit the "Aha!" jackpot.

> *The inquiry part… I basically had been teaching in that style, but didn't realize what it was. I had been trying to help students become reasoning thinkers, to use their own thought processing skills, or improve their thought processing skills. I had been trying to get them to do a better job at verbalizing and writing their thinking down, and going after it that way. So learning more about inquiry improved me as a teacher, ten-fold.*

Leadership Development

During the first ARSI summer academy, the Teacher Partners also learned about leadership and leadership skills. For Barbara those new ideas about leadership were a radical divergence from her previous conceptualization of what school leaders were and did. The new ideas were as stimulating and motivating to her as were those about inquiry and constructivism.

> *The leadership component of that summer academy really hit home with me. Helping people discover quality (math and science) programs, and then moving on their own without you being the one getting the credit for the move. That is how I really felt change could be effective. And if people saw the need for change and they wanted to change, there could be some movement. So one of the things*

that really stuck out with me, was the idea of the change facilitator… Being a facilitator, being the guide, being the person that offers the support – those components, I began to see, were extremely important for working with teachers.

Nevertheless, serving as a teacher leader, hoping to facilitate meaningful conversations about teaching and learning among teachers in her home school, was a daunting prospect for Barbara. Her first response was—"Oh, my God, they want me to work with teachers at my own school!" Barbara was panic-stricken.

... I knew if I ever mentioned the word inquiry or constructivism in the school district, it was over. That was the end of that. So, it was really, oh my God, they don't want us to do technology anymore and now they want us to go work with our teachers!

The Oneida school district had a widespread reputation as a high performing district on state achievement tests, so teachers in Oneida saw little reason to change what they were doing in mathematics and science instruction. As a result, Barbara's newly acquired leadership skills were challenged. Like other TPs across the ARSI districts she had to find strategies for working within the idiosyncratic constraints which her district presented. Barbara described the strategies she developed to gain the trust of the teachers so that she might later begin to address issues in mathematics and science education more explicitly.

In the Oneida schools' culture teachers feel like they are the educated force. They already know what they are doing. So they have a distrust of anyone who wants to see things changed.

So my thinking was the following… what I can do is offer everybody everything coming down the pike. If they want to go to a conference, if they want to try the new materials, I would make it happen. 'What do you need in order to do more science activities in your classroom? What are the materials that you need? I will go find them for you.' Or, 'Would you like for me to come in?' Now that was a big issue. The teachers did not like for you to come into their classroom and they didn't like for you to be there watching them… So, I was very careful.

Networking with Other Teacher Partners

The intensive summer academies, the weekend conferences, and the monthly meetings ARSI sponsored quickly created an initiative wide network of the Teacher Partners that provided psychological and practical support to all. The Teacher Partners came from six different states, but they shared common goals and faced common challenges as they tried to introduce and promote

improvement in mathematics and science teaching in their own schools and districts. Barbara notes:

> *There were a lot of ARSI teachers who were struggling to find the right answers and so the network was real strong. I felt like I wasn't alone… Before I started working with ARSI, I had taught different than most other teachers in Oneida. My classroom was different… and it was like I was by myself. I felt really isolated and I felt like there was something wrong with me.*
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> *But ARSI gave me a group of people that talked the way I did, and believed the way I did. We were learning at the same rate. So the network was a very important part of ARSI, and of this process for me. It was very important to have that network of support. I had people I could call. I had people I could email. I looked forward to each meeting because we would have an exchange of ideas… we talked about what we were doing and how things were working. As we worked through that, I had a growth of confidence in what I was doing. That was real important… because when you feel confident in the direction you are going, you will continue in that direction. That was important.*

Becoming Empowered to Face New Challenges

In addition to providing Teacher Partners with a wealth of new ideas, and the support of a growing network of relationships and acquaintances, ARSI deliberately gave the TPs hurdles to jump. For example, ARSI leaders challenged Barbara not only to initiate change in her own school, but also to learn about funding for mathematics and science education in her district. For the Teacher Partners this task struck at the heart of the social norms and hierarchy, the way things were done and not done in the school and district cultures from which they came.

> *The things ARSI was telling us that we, as professionals, really should have known was a real culture shock to us, but I didn't realize that then…*
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> *They wanted us to become acquainted with how science and math was funded in our school district. I was <u>not</u> going to go ask those people how they spend their money! I was afraid to ask about the funding issue, because I was afraid they were going to tell me it was none of my business. I didn't want to make any waves with anybody. I wanted everything to be smooth sailing. No one had ever told me in my education courses what the process was for funding a school. I didn't know. I honestly didn't know where the money came from. So I didn't know anything about it, I really didn't. It was interesting to finally ask and find out.*

Invoking the ARSI Name

As Teacher Partners confronted the challenges of promoting the improvement of mathematics and science teaching in their own districts they drew on the support of their new knowledge, the support of their colleagues in the ARSI network, and they also found support in the prestige of the ARSI name.

> *This was the good thing about ARSI, because I could go to the supervisor of instruction or some one else in the administration and say, "Look, they want us to find out about this stuff, what is it?" Every time something came up and I needed help from administration, I didn't hesitate to use the ARSI name. I could say we need to look at this, the ARSI people are wanting to know this… and that did work.*

Applying the Lessons Learned from ARSI: The South Fork LSC Pilot Project

Although Barbara Shoemaker's position as a Teacher Partner in Oneida ended, what she had learned through ARSI did not. The lessons she had learned started to incubate and grow. Barbara began to envision building a regional consortium of school districts, banded together to support mathematics and science education improvement. The consortium as a group of Appalachian districts, she reasoned, would be stronger and better able to capture the notice of publishers and curriculum developers in ways that a single isolated school district could not. Together they could work together toward improvement in ways that a lone district could neither initiate nor sustain.

Using as a model an elementary science education improvement project she and other key people visited in El Centro, California while she was still an ARSI TP, Barbara spearheaded the formation of a consortium of 11 school districts. Together they applied to the National Science Foundation for a two year pilot grant for the South Fork Local Systemic Change (LSC). The focus of the pilot was to improve science teaching and learning in the elementary grades in these 11 school districts.

The South Fork LSC pilot was designed to serve 22 elementary teachers leaders, two from each of the collaborating districts. These teachers received about 200 hours of professional development, including summer institutes, academic year meetings, on line study groups and on line instructional and content support. Eleven principals from the participating school districts also were involved in approximately 70 hours of training on state standards, inquiry science, and study groups centered on science learning and reform.

Barbara described the connections between her ARSI experiences and the LSC pilot in these words, "We took the ARSI model, and we tried to perfect it." In the design and implementation of the LSC pilot, Barbara had the opportunity to reflect on what she had learned through ARSI and to design the new project accordingly.

> *I had the freedom to do what I wanted with the LSC teachers… I started working on the important components for teachers to go through changes, based on what I had been through in ARSI. They needed an awareness of different (teaching) strategies. They needed to know how things were changing in education. So when I got to do the LSC, I got to really set up the program in a format where I could take all these quality programs that I had been exposed to and really put them to the test, really use them with this group of teachers. And I think it worked.*

Barbara deliberately rolled over key features of the ARSI work into this new project. She designed the LSC pilot to include: a focus on inquiry; an exposure to standards; work on science content; exposure to and training on kit-based science programs; training in curriculum and instructional leadership; the building of a strong teacher network; and, finally, providing opportunities for teachers to attend conferences and to visit other districts.

She noted that the LSC also benefited from even broader "lessons learned" in the ARSI project. In particular, the South Fork LSC involved two teachers from each district, rather than just one so that the teachers could support each other in the work of reform. The South Fork LSC also applied the "less is more" principle. They started small, with a limited number of districts and teachers. The focus was on facilitating change in the classrooms of these teachers first, before they attempted to change instruction throughout the school and district.

The First Year

During the first year of the project, Barbara visited each of the 22 teachers once a month. She modeled lessons for the classroom teachers, team taught with them, and provided support for their attempts to examine and develop their own teaching.

In particular, with the help of outside content experts the nascent LSC leadership developed a matrix for aligning science content in grades K-6. The matrix covered life science, physical science, earth science and a general category which included ecology and environment. To support the science content addressed in the matrix, the project purchased four science kits for each grade level. Barbara's

aim was to help the teachers learn to use the kits through her personal, coaching visits to each classroom. She also developed an internet chat group as an avenue for teachers to share experiences around the implementation of kit-based science, because the teachers were so scattered geographically.

In the late spring of 2001, the end of the first year of the project, Barbara facilitated a day long seminar for the 22 teachers to evaluate the first year's work. They also laid plans for how they would lead other teachers in their respective schools in the implementation of kit-based science instruction. The teachers agreed that they needed more content study, more curriculum work and a closer look at the different kits. This retrospection set the agenda for their Summer Academy, which was also a key component borrowed from the ARSI model.

Barbara described the first Summer Academy in these words:

> *We had three days. Each morning we had different vendors present to us – the first morning was Insights, the second STC, and the third morning FOSS. Teachers wanted to see what was out there and what was available.*

Curriculum work was also on the agenda.

> *In the afternoon we looked at the Kentucky and Tennessee core content and program of study documents. Each day the K through 6 teachers looked carefully at the life science, physical science and earth science areas, and what was to be covered at each grade level. The teachers were absolutely overwhelmed. They had never worked with curriculum. Most of their knowledge came from textbooks. So we looked at what each state wanted them to do. The states had laid out a massive amount of science to be taught and it was interesting to these teachers to realize how many different science concepts were to be covered each year. So we started learning, and mapping out exactly what we needed to cover at each grade level and each year.*

This work led to the development of a new curriculum matrix and an overhaul of the content that each grade level would address in the three science categories. Building on the matrix development, Barbara then invited a content specialist, either a university professor or a scientist, to help the teachers do a review of how well the kits were addressing the targeted concepts and the state standards. She described the impact of the sessions in this way:

> *It was an interesting conversation between the teachers and the scientist. Number one, the scientists were a bit overwhelmed by what was required of the teachers. Two, the teachers brought to the attention of the scientists that they were very weak in content knowledge, especially in physical science… They were*

also having a hard time finding materials to cover what the states were asking them to cover. But it was a wonderful three days for the teachers to work with the scientists, and to work on content, and to look at curriculum, and to see what different kits had to offer. And so through that interaction we came out with a newer matrix of what they felt would be very successful for their students.

As the first year of the project ended, the teachers articulated their professional needs and goals. They wanted opportunities to see other teachers teach, and they also wanted to address their own weaknesses in science content. They were interested in knowing more about ways to maintain and distribute their science kits, and finally, they wanted more leadership training.

The Second Year

As the second year progressed, the main thrust of the LSC work continued to center on the teachers' kit-based science instruction. In addition Barbara continued to arrange additional professional opportunities for the teachers. In particular, to help the teachers become aware of student misconceptions in science she organized a study series using the Project Universe tapes which focused on student misconceptions and instructional strategies for addressing them. The LSC teachers also visited a district in Ohio to investigate how to set up a science resource center in their area to help with the distribution and refurbishing of their kits, and they participated in a two day leadership workshop.

After two years, the funding for The South Fork LSC pilot project ended in July of 2003. When the participants were asked to talk about the project's impact and its future, one teacher leader responded with this view:

I really want to see the project continue. I think it is one of the most wonderful things that we have had in long time. It is not a fly-by-night or a quick fix. It has really been thought out well – that impresses me the most. That's because one of the biggest complaints that teachers have is that a new program will come in. They give it to the teachers, and say, 'Here, figure it out. Do it yourself.' That is why when I talk to other teachers I tell them, 'This project is not that way, this is going to be totally different. You are going to be trained. It is a long-term process that we are looking at here, we want everybody trained.'

Another participant credited the LSC with transforming her views on teaching and learning, and also increasing her confidence and skills to be a leader in science in her county:

When I started this program, I only thought about myself and my classroom. Barbara broadened my thinking. She wants you to see the bigger picture. This is

all she talks to me about -- you have to go beyond your room, and we need to encourage others. This past summer we did a leadership session. This training was critical to my [curriculum resource] position this year. I never would have been in this position, nor thought I could have moved into it without the LSC program experience. I am probably the one who has moved the farthest… it has changed my life. It was a pivotal point in my career, and I have people looking at me and talking "principal" now. Just four years ago I would never have dreamed that this would be me.

Barbara's reflections about the professional growth of the group of 22 teachers were equally positive. Looking in retrospect, she noted that the LSC teachers were much more self aware of themselves as professionals. She had seen them change their instructional strategies. They had a different view of what science was and how it should be taught. They also recognized their own need for strengthening their content background in science.

And, although most of the LSC teachers' work had been confined to their own classrooms, Barbara reported that after two years they felt ready to work with other teachers in their own districts, and to increase their own presentation and leadership skills. Finally, she noted, they wanted to become more involved in national programs, to look outside their own districts to other parts of the world to see what was current in education. Over the course of the South Fork project, the teacher leaders had been building their own knowledge, capacity and understanding, so that, according to Barbara, "When the next grant comes, they will be ready to take the next step."

When we asked Barbara to reflect back on her role in the project, she admitted that the work of keeping the project going had been overwhelming for one person.

I was not able to visit the classrooms as much in year two as I would have liked. Part of the problem was that the project was supposed to have several people to help with the administration. That didn't happen, and so most of it fell on my back. I was not able to go after future funding, keep up with the kits, promote the science resource center, work with teachers, work with principals and keep every thing else going… I had to decide what to do and how to do it, and then come up with the resources to do it, and I just couldn't do it all.

Barbara's commitment to the project and the participating districts did not diminish with the LSC funding. The schools agreed to continue to release the teachers to come to training sessions and to support the use of kits for teaching science in the schools. As for Barbara, although she accepted a full time job with First Hand Learning, a nationally recognized elementary science curriculum

development organization based in Buffalo, New York, she continued to volunteer her time. She worked with the teacher cadre and continued to seek support to complete the science resource center. The strength of commitment to improving science education in her community is evident in the following remarks:

> *The teachers that I have worked with in the LSC have been the biggest joy that I have had in my professional life. They are so excited about teaching science now. When we started out, very few of them had ever used a science kit. Now they are begging for kits all the time. They incorporate more field- trips and more of their area in their science classes by using these kits.*

Moving On

In January of 2005 Barbara's association with both the South Fork LSC and First Hand Learning came to an end. This notice appeared in the Knox News Sentinel:

> *A nonprofit organization dedicated to supporting the Big South Fork National River and Recreation Area has hired its first full-time executive director. Barbara Shoemaker, who taught math and science in the Oneida School System for 14 years, joins the Friends of the Big South Fork at a time when the group is making big plans for the future.*

In a sense, Barbara's career had come full circle. Her early work as a landscaper had influenced her teaching at the secondary level. In turn, her growing enthusiasm for improving teaching and learning led her to ARSI, and her rich experiences there contributed to her development not only as a classroom teacher, but also as a knowledgeable, far reaching teacher leader. In particular, the lessons she learned through ARSI laid the foundation for her leadership in creating the South Fork LSC. Now, as she began her role as Executive Director of The Friends of the Big South Fork, she was taking on a new challenge in her community which would call into play all of the capacities she had developed—her leadership skills, her knowledge of the outdoors, and her resourcefulness in creating learning experiences for a diverse audience.

> *I love change. I love seeing new things. I love learning new things. I love meeting new people and different people. The diversity… it would have been so boring without the diversity in ARSI. It was exciting. For me, stagnation is no change… But, I am a different duck.*

Looking Back at the ARSI Years: The Researchers' Perspective

One of the major goals of the Appalachian Rural Systemic Initiative was to develop indigenous leadership capacity for mathematics and science education improvement throughout the poorest and neediest counties in Appalachia. The initiative directors realized that only through locally motivated and sustained efforts, molded incrementally to the idiosyncratic features of particular districts and communities, could the changes that were needed gain a foothold and hope to survive.

The case of Barbara Shoemaker and her work with the Oneida Special School District provides a vivid illustration of how ARSI successfully fulfilled its mission to contribute to the growth and development of key individuals throughout Appalachia. Barbara Shoemaker's experience as Teacher Partner is emblematic of how ARSI deliberately supported TPs in teaching and learning in whatever ways they saw fit. Inspired and coached by ARSI, TPs across rural areas, like Barbara in Scott County, picked up the banner for mathematics and science education improvement in their local communities. Doing whatever needed to be done, garnering as much support as possible from as many people as possible, sharing what they knew with others so that they might join in the cause, and, with ARSI support almost always continuing to acquire new skills and knowledge along the way, each of the TPs fashioned their own role as change-maker.

Moreover Barbara Shoemaker's story—how she learned from her ARSI experiences and how she then applied what she was learning to increasingly influential venues within her community—illuminates well the overall ARSI approach. Through understanding how she gained in knowledge and authority, and grew to affect various constituencies in Scott County we see clearly how ARSI fashioned itself more along the lines of a community development model, than as a traditional change implementation model.

Three particular design features of the ARSI program greatly influenced Barbara's work as a Teacher Partner, and provided the lessons she passed on to others. All three of these features reflect an underlying principle present in both the ARSI *modus operandi* and typical community development approaches, namely, the principle of educating, connecting, and trusting individuals so they might find their own idiosyncratic pathways toward effective improvement.

First, ARSI introduced Barbara to current, national level issues in science and mathematics education reform and improvement. Second, ARSI gave her

leadership development training, and third, it offered her multiple opportunities to participate in the ARSI Teacher Partner network. All of these overlapping areas of her ARSI education proved to be critical, contributing to her rapid growth trajectory, and in her emergence as a leader for science education improvement in Scott County.

Barbara's first encounter with mathematics and science reform thinking occurred when she began to participate in the monthly ARSI Teacher Partner meetings. Here she was introduced to national and state level ideas and practices. Until that time, she admitted that neither she, nor the other teachers with which she associated had ever heard of inquiry, or constructivism, or standards-based curricula. Her interest in educational issues skyrocketed through her ARSI experience. These offered her support for her own emerging ideas about how students learned and what constituted quality instruction. And as her understanding of the implications of these fundamental ideas grew, she developed strategies for introducing them to the teachers in her school and her district.

Equally as compelling as current educational issues for Barbara, was experiencing a novel form of leadership. ARSI's leadership training taught her that leading others could mean more than holding a position in the educational hierarchy. Barbara began to understand leadership as a motivational, collegial enterprise. Sensitive to the likelihood of resistance to change among her co-workers, she thought through how to approach them. She sought new ways to introduce them to quality programs and processes so that they could find their own way, as she had found hers, toward reforming their curriculum and their practice. It made sense to Barbara to share the professional growth she was experiencing with other teachers in Oneida. In fact one of her principles as a teacher leader became to always include others in the professional development opportunities that were available to her—to always invite other teachers to join her in exploring new ideas and new experiences.

Perhaps the most influential experience for Barbara was the ARSI Teacher Partner Network. The network provided a rich and stimulating learning environment in which the Teacher Partners learned together about emerging issues in mathematics and science, standards, quality materials and instructional practices, and leadership. Their learning took place in a social context, where ideas and questions were easily shared, developed and expanded. The network thus served not only as a source of new information, but also as a source of inspiration and support. The TPs as well as the ARSI leaders motivated and understood one another. And finally, the network provided an alternative home for the TPs. This was particularly important for Barbara, as she struggled to find

her place in the teaching environment in which she found herself and as she attempted to promote change in her school and her district.

What Barbara accomplished in Oneida as an ARSI Teacher Partner was, as she described, a change in the status quo.

> *My own personal success with ARSI in Oneida was that science and math really were brought to the forefront and were given full attention in the schools. I had history and English people come to me and ask me if I would work with them because they wanted to get the attention math and science had.*

A less visible result of the ARSI experience but perhaps a more lasting one was Barbara's own personal and professional growth. At the end of her service as an ARSI Teacher Partner she was a different person. She was more knowledgeable, more skilled, and more sophisticated. She was also ready to apply herself to some new adventure. As the ARSI project and her association with it ended, Barbara was well prepared for still another challenge, and, as always, eager to do good for science education in some new place.