

The Appalachian Rural Systemic Initiative

REFLECTIONS ON TEN YEARS OF WORK

**INVERNESS RESEARCH ASSOCIATES
JULY 2005**

THE LOGIC OF ARSI

***MULTIPLE STEPS TO UNDERSTANDING
THE LOGIC OF THE INVESTMENT MADE IN
ARSI***

STEP 1:
***THE DEEP DESIRE TO IMPROVE THE
LEARNING EXPERIENCE
AND ACHIEVEMENT
OF APPALACHIAN STUDENTS***

The Achievement of Appalachian Students

STEP 2:
***THE NEED TO IMPROVE THE
STUDENTS' OPPORTUNITY TO LEARN
MATHEMATICS AND SCIENCE IN
APPALACHIA***

***The Opportunity to Learn
Mathematics and Science***

OPPORTUNITY TO LEARN

Opportunity to learn includes:

- Motivation and incentive***
- Well-designed activities***
- Important and accurate math and science***
- Age-appropriate activities***
- Accessible, attractive, inclusive invitation to participate***
- Activities relevant to the audience, place***
- Diverse and multiple approaches***

STEP 3:
***THE NEED TO CREATE “RICHER” MATH
AND SCIENCE CLASSROOMS FOR
APPALACHIAN STUDENTS***

The Need for Rich Classrooms

***GOOD TEACHERS
AND GOOD TEACHING
CREATE
“RICH CLASSROOMS”***

***IN RICH CLASSROOMS THERE ARE
MULTIPLE, WELL-DESIGNED,
ENGAGING AND APPROPRIATE
OPPORTUNITIES FOR STUDENTS
TO LEARN THE DISCIPLINE.***

***(RICH CLASSROOMS ARE
CLASSROOMS YOU WOULD WANT
YOUR OWN CHILD TO BE IN.)***

SOME CRITERIA FOR RICH CLASSROOMS

- *There is active and authentic engagement of students – physical, intellectual, emotional.*
- *There is a presence of student dialogue, making student knowledge and thinking explicit.*
- *Students are provided with meaningful and content-rich tasks.*
- *Teacher and student actions are purposeful, following a conceptual roadmap.*
- *Teacher is deliberate and thoughtful regarding strategies and approaches.*
- *There is a culture of inquiry, respect, and seriousness.*
- *There is an absence of boredom, chaos, mindlessness, and activity for activity's sake.*

GENERATED BY LAS VEGAS PRINCIPALS

RICH CLASSROOMS AND AT-RISK CLASSROOMS

• RICH CLASSROOMS

- Presence of materials and resources*
- Teacher is knowledgeable, confident and interested in the discipline*
- Teacher has lots of instructional options*
- Student has multiple routes to success*
- Redundancy*
- Environment of hope*

• AT-RISK CLASSROOMS

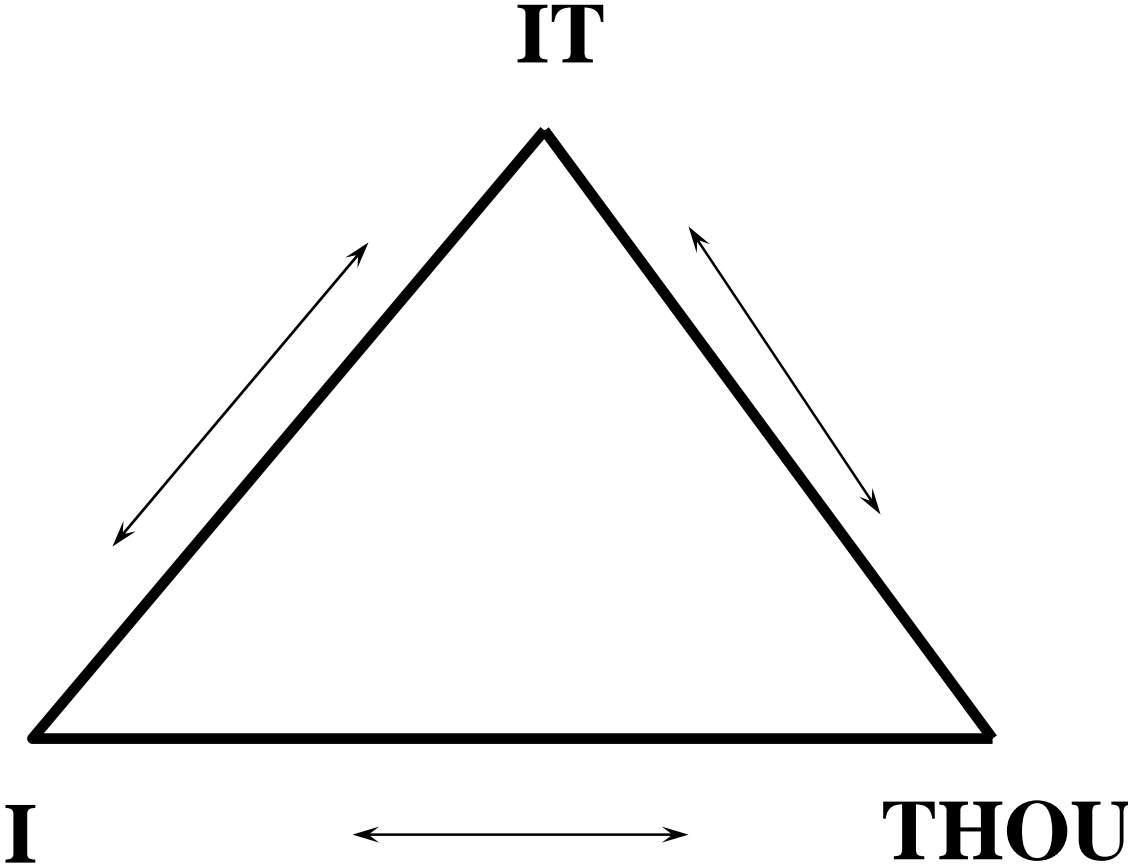
- Absence of materials and resources*
- Teacher is lacking in knowledge, confidence and interest in the discipline*
- Teacher has few instructional options*
- Student has single route to success*
- Lack of redundancy*
- Environment of hopelessness*

***WHAT CREATES RICH
AND AT-RISK CLASSROOMS?***

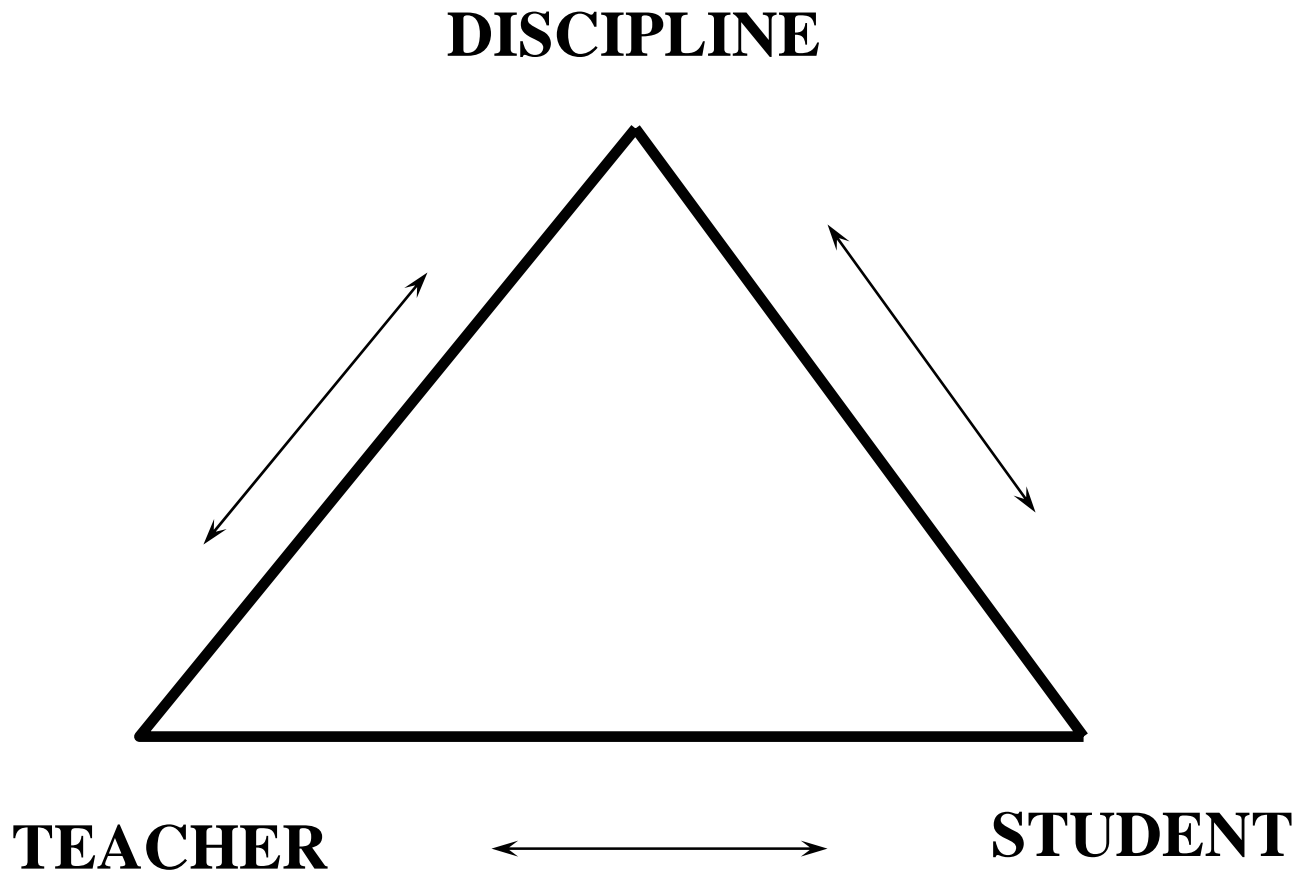
***GOOD TEACHING
(AND RICH CLASSROOMS)
HAPPEN WHEN THERE IS A STRONG
RELATIONSHIP:***

- *between the teacher and the student*
- *between the teacher and the discipline*
- *between the student and the discipline*

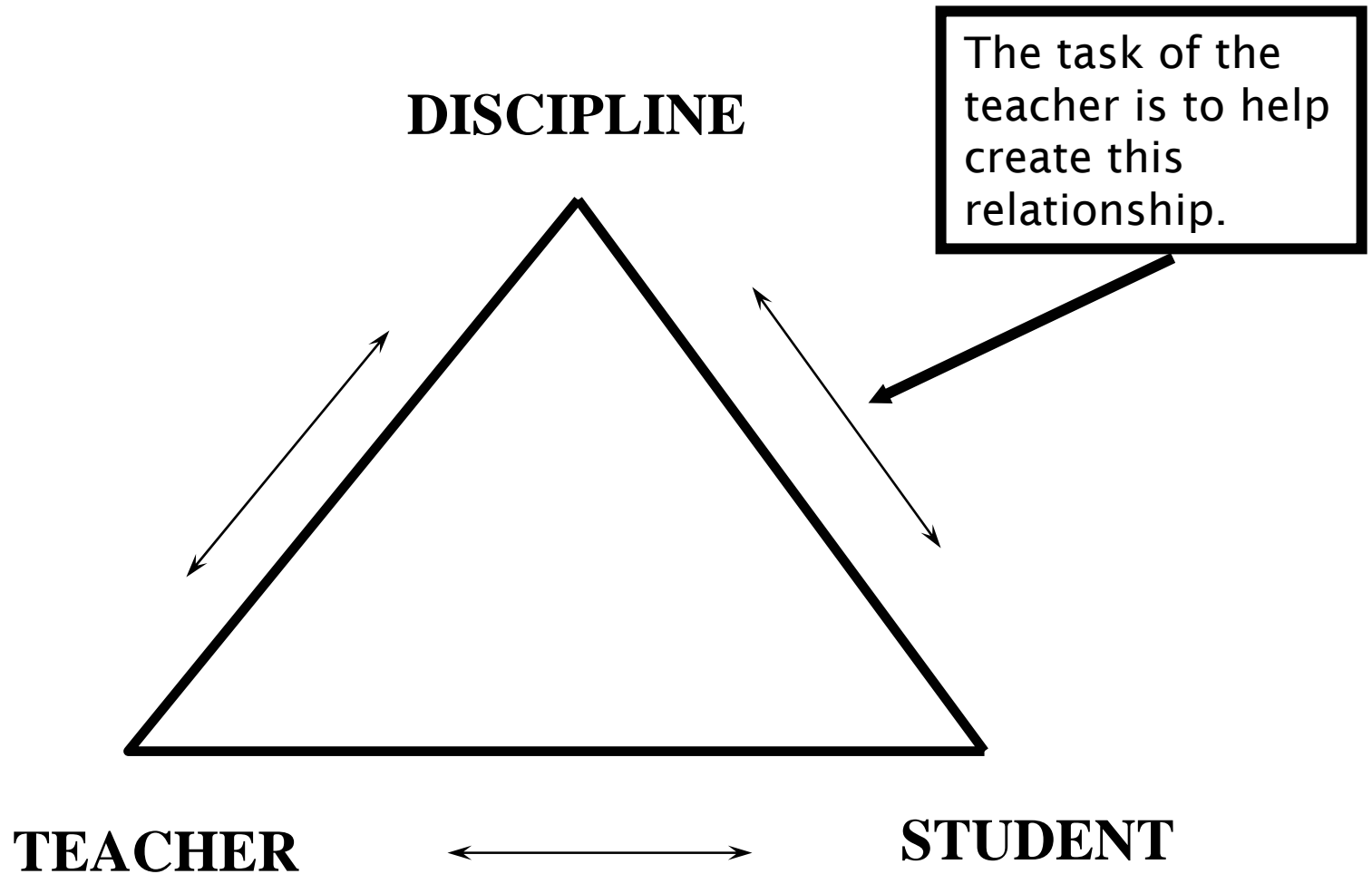
(MARTIN BUBER)



THE RELATIONSHIP TRIANGLE



THE RELATIONSHIP TRIANGLE



STEP 4:
***THE NEED TO IMPROVE THE ABILITY OF
THE SCHOOL SYSTEM TO SUPPORT
TEACHERS IN CREATING RICH
CLASSROOMS***

***The Need to Improve the Ability of the System
To Support Teachers in Improving Their Classrooms***

SYSTEM SUPPORTS THAT CAN HELP TEACHERS IN IMPROVING THEIR CLASSROOMS

- ***Professional Development***
- ***Curricula***
- ***Instructional Materials***
- ***Vision (Standards)***
- ***Productive Use of Assessment and Data***
- ***Policy Alignment***
- ***Administrator training and support***
- ***Community engagement and support***

STEP 5:
***THE NEED TO CREATE
THE CAPACITY TO IMPROVE
THE ABILITY OF THE SCHOOL SYSTEM
TO SUPPORT TEACHERS
IN CREATING RICH CLASSROOMS***

***The Need to Create the Capacity
for System Improvement***

Improving the Achievement of Appalachian Students

***Improving the Opportunity to Learn
Mathematics and Science***

Making Teachers Stronger and Classrooms Richer

***Improving the Ability of the System
To Support Teachers in Improving Their Classrooms***

Creating the Capacity for Ongoing System Improvement

ARSI

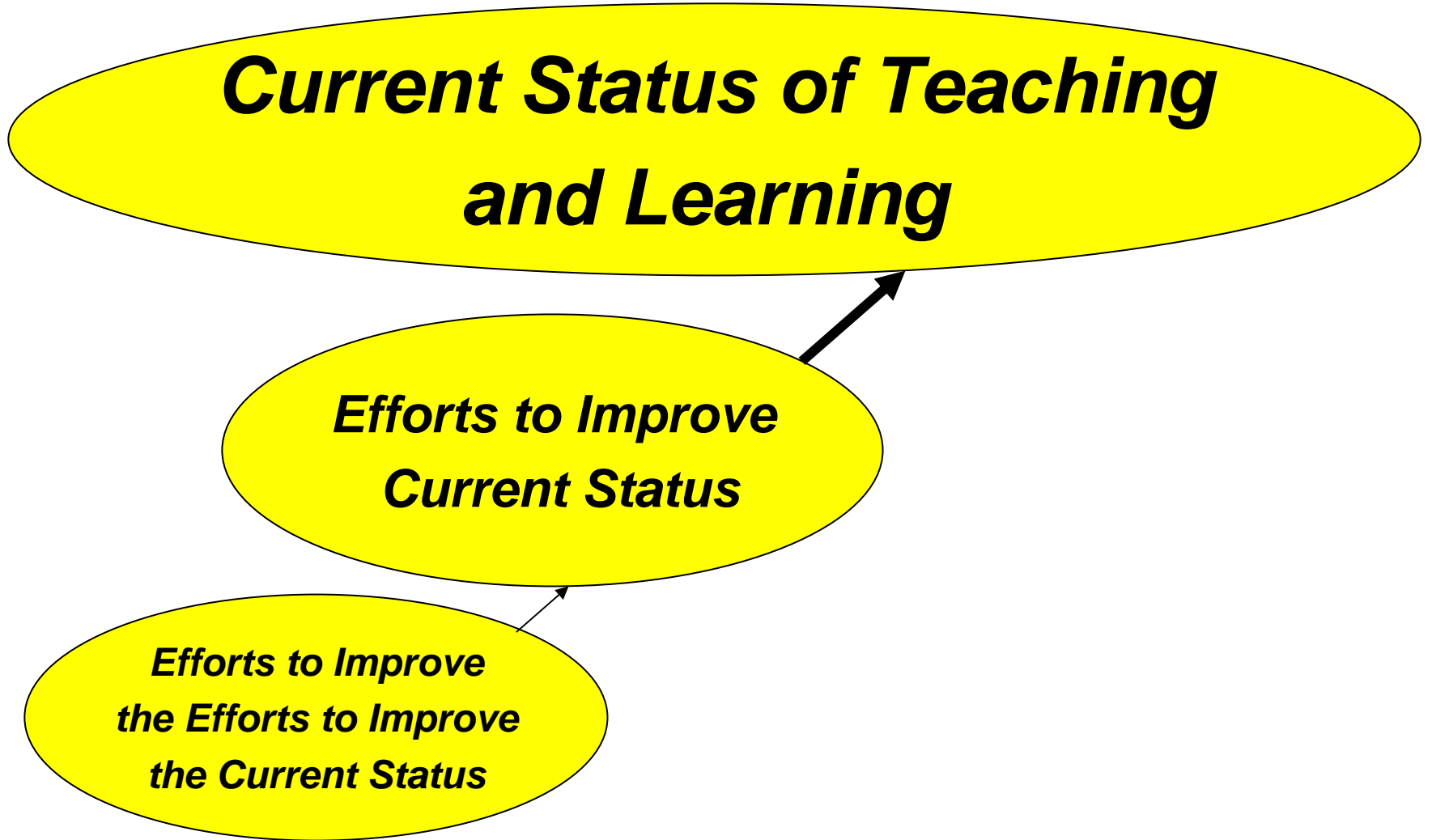


***WE NEED TO GET BETTER AT
GETTING BETTER***

***Current Status of Teaching
and Learning***

***Efforts to Improve
Current Status***

***Efforts to Improve
the Efforts to Improve
the Current Status***

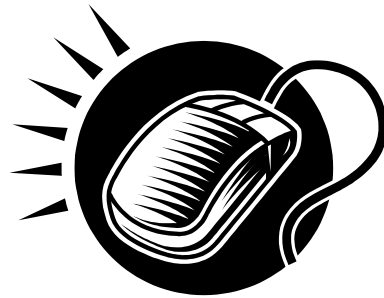


***THE IDEA OF THE
IMPROVEMENT INFRASTRUCTURE***

***ORIGINS OF IMPROVEMENT
INFRASTRUCTURE***

DOUG ENGELBART

Inventor of the



DOUG ENGELBART

Every organization has a “capability infrastructure” – what we use to do our jobs.

Organizations also need an “improvement infrastructure” – what we do to get better at getting better.

THE IMPROVEMENT INFRASTRUCTURE

The foundational structure that gives a system the capacity to design, implement and sustain a process of ongoing improvements in the functioning of the system

KEY ELEMENTS OF AN IMPROVEMENT INFRASTRUCTURE

- ***People – with expertise and mandate for improvement, linked in a community***
- ***Ideas – about structures and processes of improvement***
- ***Tools – resources, materials, and processes for undertaking improvement***

QUESTION:

*WHAT WOULD AN APPALACHIAN
IMPROVEMENT INFRASTRUCTURE FOR
MATH AND SCIENCE EDUCATION LOOK
LIKE?*

WHAT ELEMENTS?

- ***Which people?***
- ***What knowledge?***
- ***Which tools?***

*WHAT CHARACTERISTICS WOULD IT
HAVE?*

RURAL MATH AND SCIENCE EDUCATION: CHARACTERISTICS OF AN EFFECTIVE IMPROVEMENT INFRASTRUCTURE

- ***Guided by a strong sense of purpose and mission***
- ***Guided by strong leadership***
- ***Composed of strong people joined together in a community***
- ***Access to and producer of knowledge about change***
- ***Access to and producer of tools for change***
- ***Long-term, ongoing, recognized, funded***
- ***Cumulative***
- ***Robust – able to withstand political and financial instability***

RURAL MATH AND SCIENCE EDUCATION: CHARACTERISTICS OF AN EFFECTIVE IMPROVEMENT INFRASTRUCTURE

- ***Responsive and flexible; evolving its work***
- ***Indigenous – of the people, by the people, for the people***
- ***Grassroots, not top-down***
- ***Inclusive, representative***
- ***Vision of improvement – Balance local needs and national vision***
- ***Common principles but able to customize work for local conditions***
- ***Well-connected; good communication***

***THE IMPROVEMENT INFRASTRUCTURE
CREATED
BY ARSI***

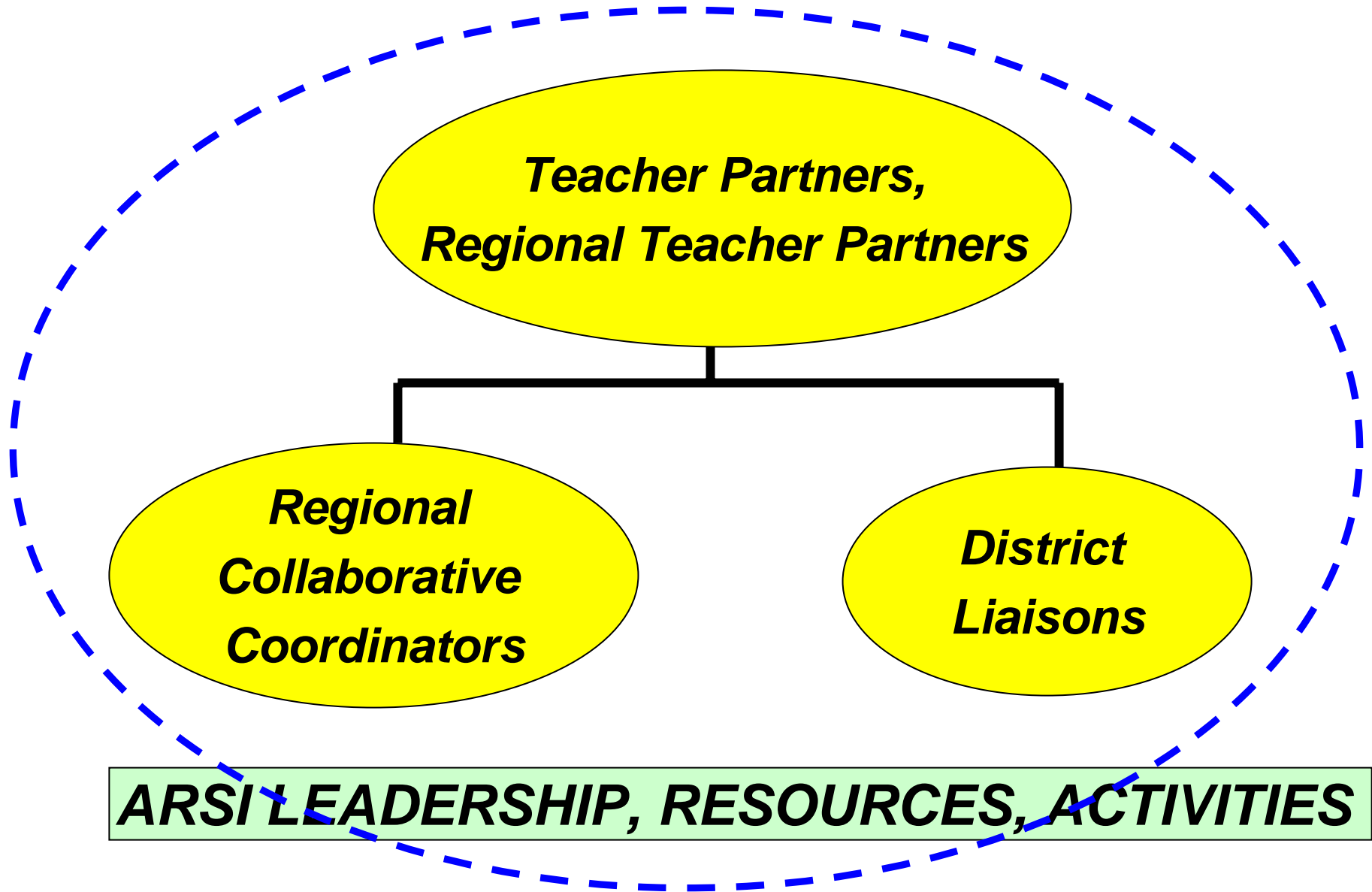
- ***People***
- ***Knowledge***
- ***Tools***

THE PEOPLE

“THE LEGACY IS US”

The people of ARSI – those who do the work of ARSI – are also the major contribution of ARSI. The legacy of ARSI is primarily to be found in the motivated and skilled individuals who are left behind...

THE ARSI IMPROVEMENT COMMUNITY



***WHAT DOES THE EVALUATION DATA
SAY ABOUT THE ARSI
IMPROVEMENT
COMMUNITY?***

DATA SOURCES:

- ***Surveys of Teacher Partners and District Liaisons***
- ***Reflective writing of Teacher Partners***
- ***Site visits to ARSI schools and districts***
- ***Interviews with Regional Coordinators, Regional Teacher Partners, Teacher Partners and District Liaisons***
- ***Case studies of Teacher Partners***

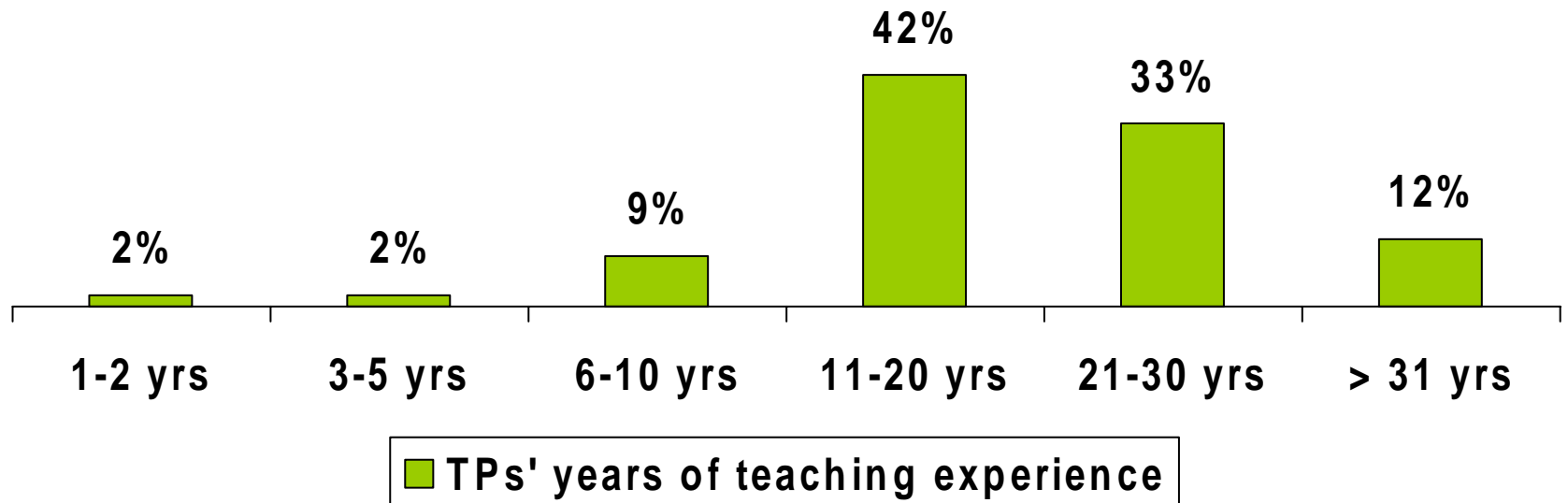
THE SURVEY – SPRING 2005

*43 Teacher Partners (TPs) and 25 District Leaders (DLs) from
6 states responded to the survey*

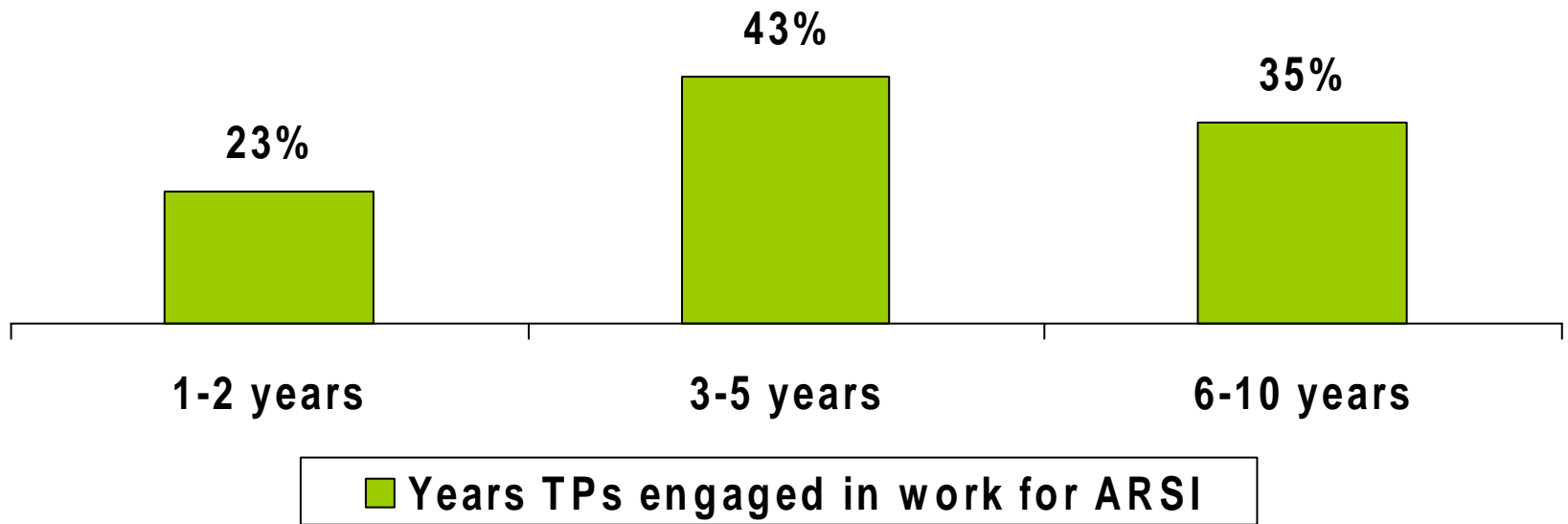
	<i>TPs</i>	<i>DLs</i>
<i>Kentucky</i>	<i>28</i>	<i>16</i>
<i>North Carolina</i>	<i>1</i>	<i>0</i>
<i>Ohio</i>	<i>2</i>	<i>0</i>
<i>Tennessee</i>	<i>3</i>	<i>3</i>
<i>Virginia</i>	<i>2</i>	<i>2</i>
<i>West Virginia</i>	<i>6</i>	<i>2</i>
<i>Unknown</i>	<i>1</i>	<i>2</i>

The Teacher Partners

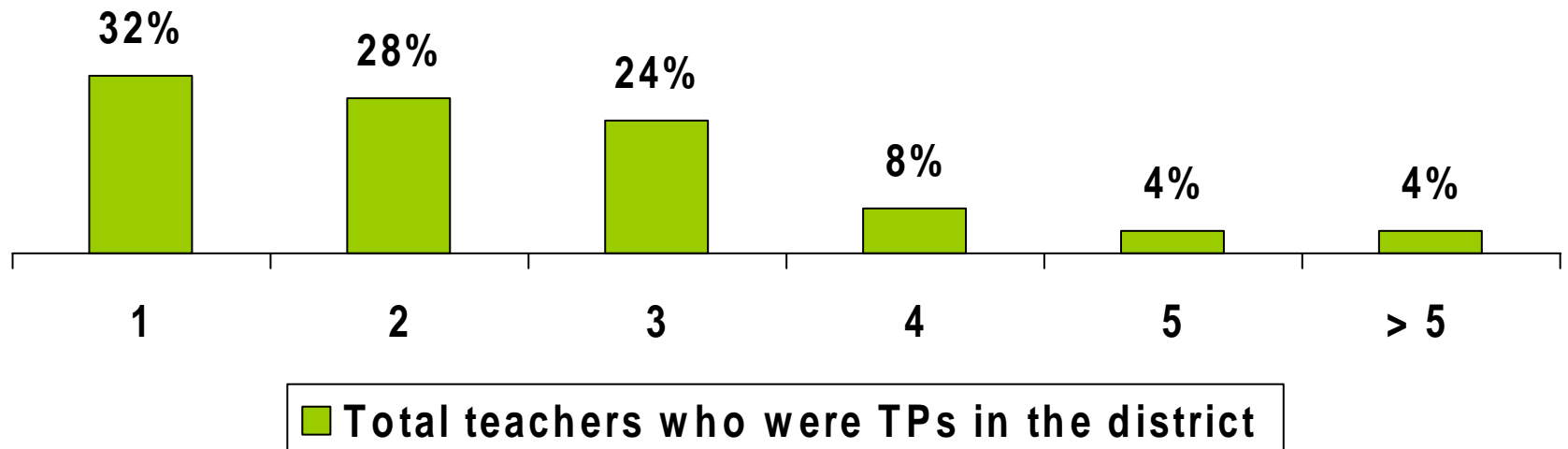
TPs bring years of classroom and district savvy to their work for ARSI



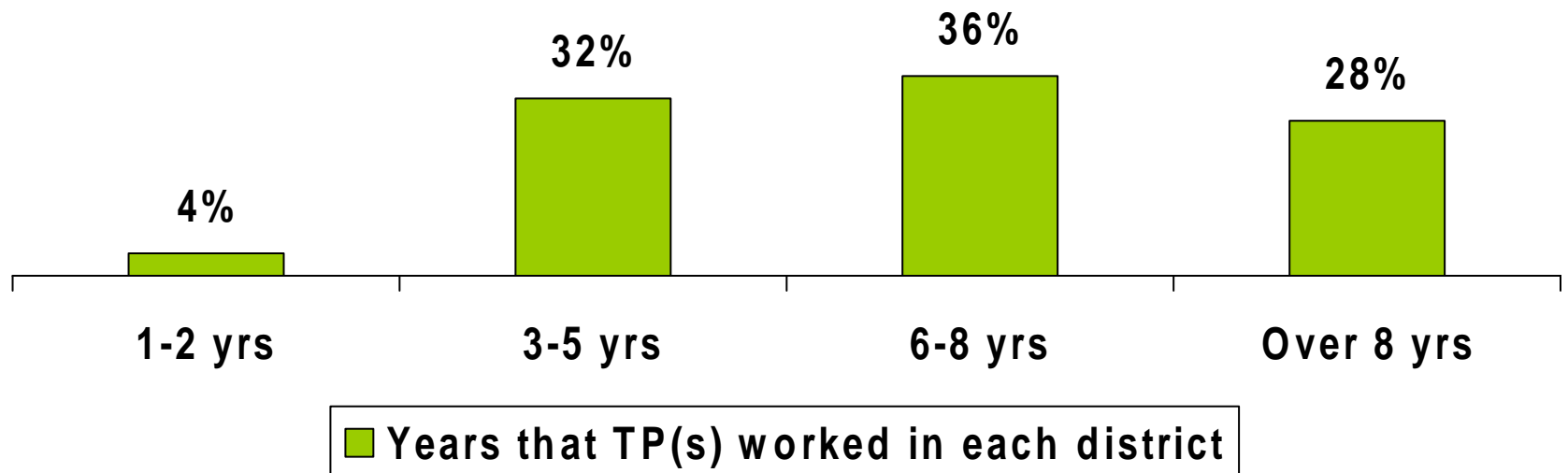
Most current TPs have worked as Teacher Partners for a number of years



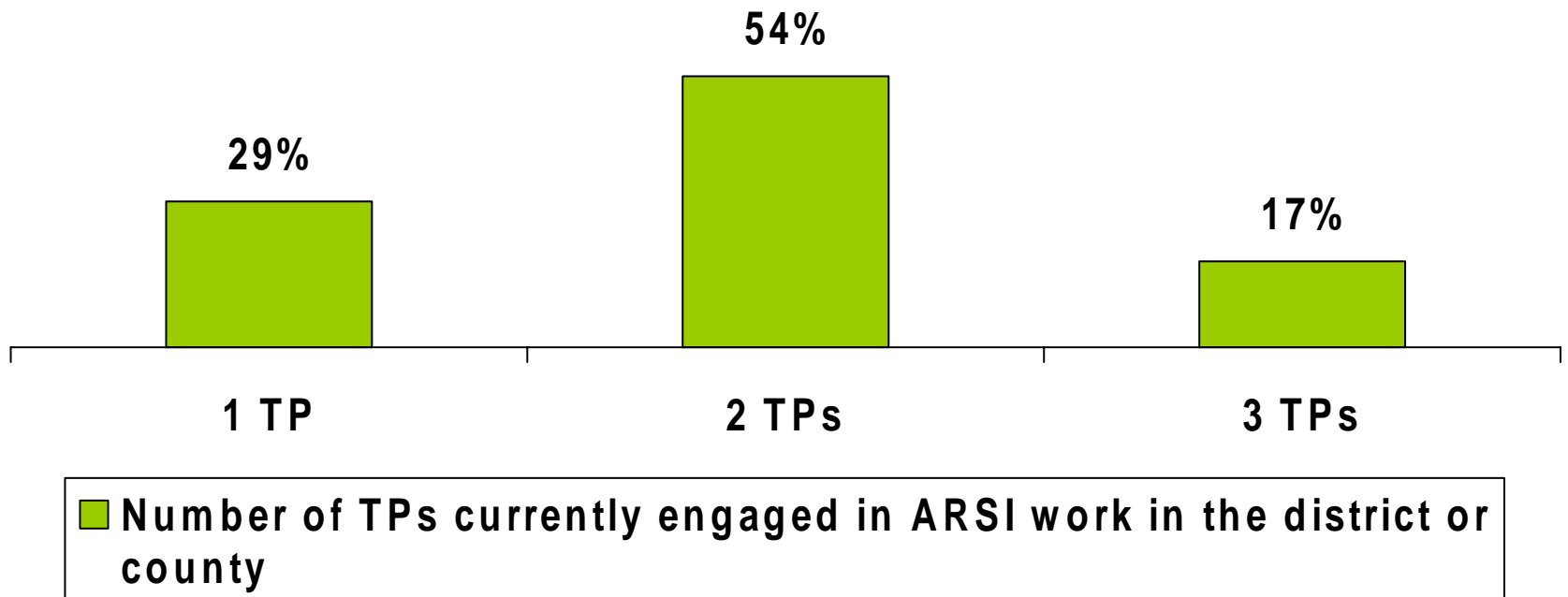
In most counties, the TP role over the years has been filled by several different teachers



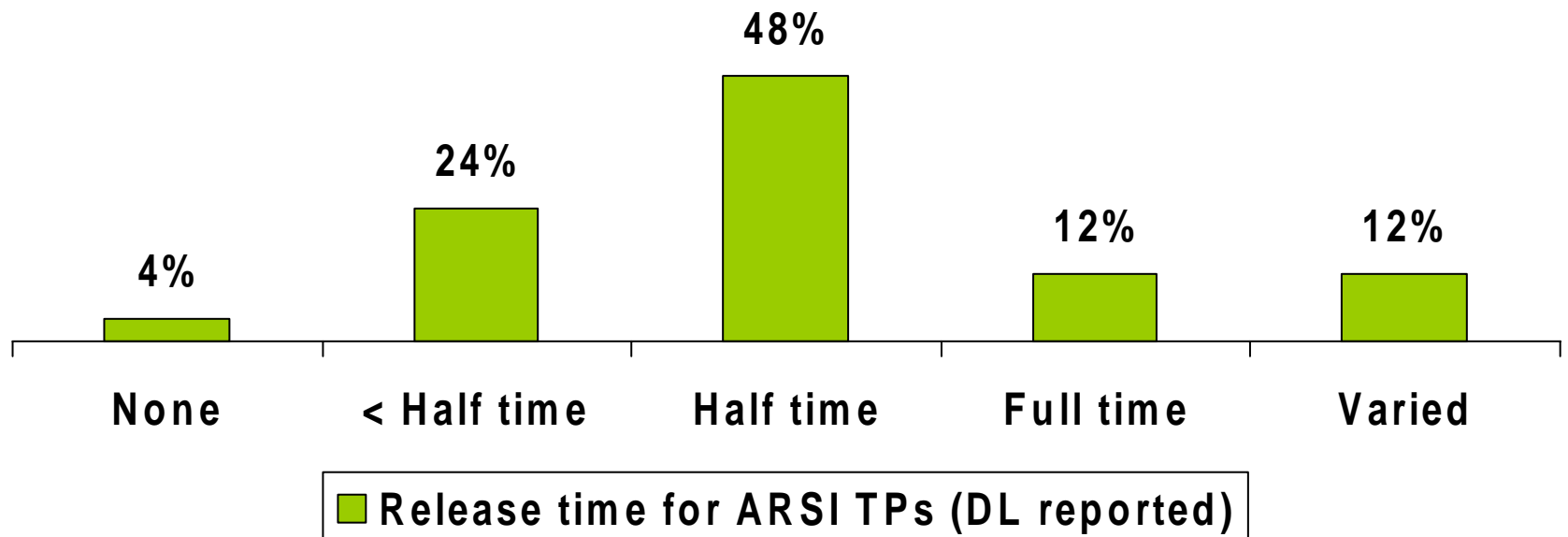
Many counties have been served by ARSI TPs for almost a decade



Most districts and counties currently have more than one Teacher Partner



There are many different arrangements for Teacher Partners



What is a Teacher Partner ?

“Quotes”

The TP as “Standard Bearer”

One of the things that struck me is that at the time ARSI began its work, there really wasn't a keeper of the vision for math and science in those districts. There wasn't someone to lead the charge... there were no - and still are no - math or science supervisors; everyone is a generalist... The 'central office' staffs tend to be very small and so the ARSI-supported “teacher partner” became the standard-bearer for math and science reform in those districts...

The Teacher Partner – Building on Strength

When I began as a Teacher Partner, I had already been teaching science for 18 years and was pretty active at the local and state level. I had already taught numerous science courses and worked with grades 7-12. I was also active in serving on the county textbook adoption committee, attending state and national conferences, and providing professional development sessions. In many ways, I was already serving in a leadership capacity.

However, upon my involvement with ARSI, I became better trained – and was given resources that I could use and share with others. ARSI empowered me to be more of a [proactive] leader rather than waiting for an opportunity...

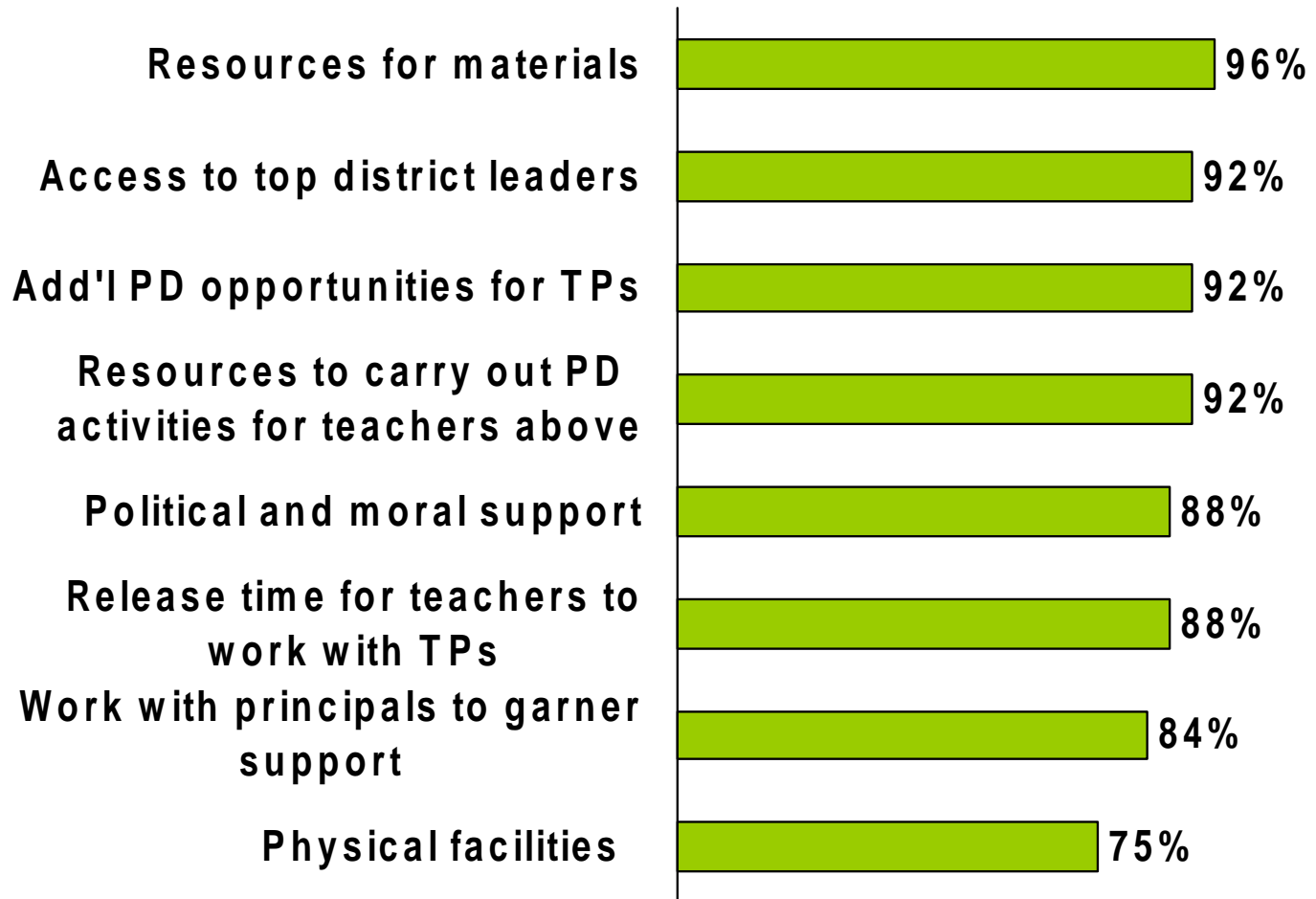
This changing attitude – and a responsibility to service – gave me the opportunity to step up to the plate and really get involved in math and science reform.

Teacher Partner as the Builder of Local Capacity

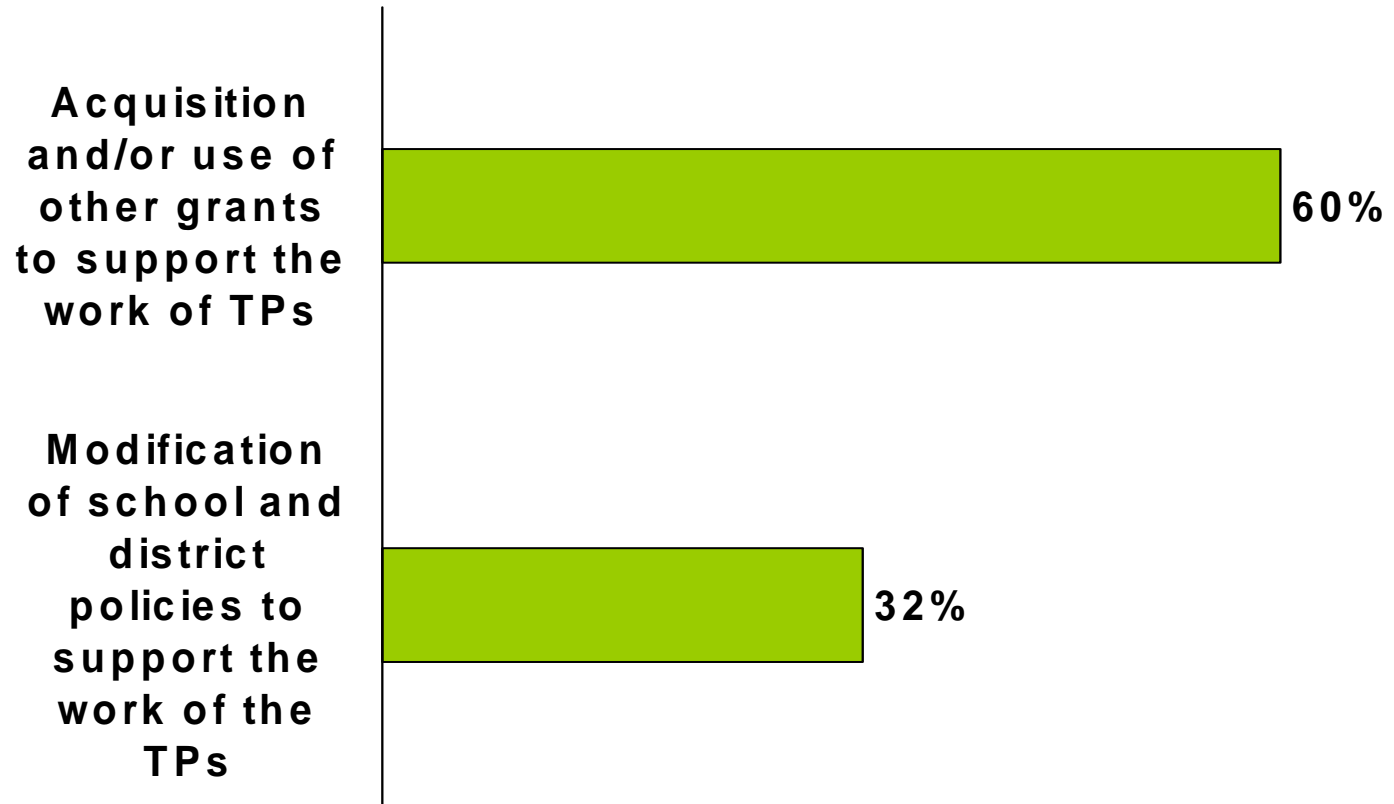
It seems to me that the big issue for all of us is building capacity, however you want to define that capacity... If you have a strong local teacher working with you, then they remain as a residue in the district even after you are gone... Then your work as a Teacher Partner leaves a residue... And if you invest your own time and effort into that local person, then you have put capacity in the district, then the district can continue to build on that legacy...

Regional and Local Support for Teacher Partners

Most districts have provided a cluster of supports to ARSI TPs



Some districts have supported ARSI TPs in other ways



Regional and Local Support for Teacher Partners

“ Quotes ”

Support and Guidance

I have to give most all of the credit for my growth to a few people who have allowed me to have this opportunity: my superintendent, my supervisor (and district's DL for ARSI), and especially my ARSI Collaborative Coordinator. Without the support and guidance of these individuals, I could never have grown the way that I have. I don't remember a single time when I requested something and did not receive their support and encouragement. I also know our district strongly believes in the TP concept because of everything it has achieved... We have a district team which will be around a long time and would be one of the very last programs to be cut.

ARSI has created a “hunger”

I am hungry for what ARSI has taught me to expect. ARSI has provided me with the most current thinking on instruction, assessment and professional development. I have benefited from the text resources provided by ARSI and the inner quest and incentive to seek new information that allows me to acquire on-my-own knowledge that gives me the opportunity to help other educators in our Appalachian school districts. The ARSI TP network is a world within itself. ARSI is the rock/foundation/tool from which we can make great strides in eliminating the achievement gap in our Appalachian schools.

The professional and personal
rewards of ARSI participation for
Teacher Partners and District
Liaisons

Benefits to Teacher Partners

I have become aware of and familiar with state and national standards in math and science. 100%

I have learned about standards-based curriculum and instructional materials. 100%

I have become familiar with a range of resources for math/science improvement that can be used in my school and district. 100%

I have learned useful processes and strategies for supporting math/science improvement in my school and district, e.g. strategic planning, data analysis, etc. 98%

More Teacher Partner Benefits

I have learned to be a strong advocate for math/science education improvement in my school and district.	98%
I have gained confidence in myself and developed my professional stature.	95%
I have learned how to work with classroom teachers to improve math/science instruction.	95%
I have become committed to furthering my own education and training in the future.	95%
I have gained experience and expertise in providing professional development to teachers in my school and district.	95%

Even More Teacher Partner Benefits

I have learned to work successfully with my school principal in the service of math/science improvement. 91%

I understand better how a district works and how to get things done there. 91%

I have learned how to work with a range of adult learners, including members of the community in the service of math/science improvement. 88%

I have become more comfortable speaking in public settings. 88%

I have learned to work successfully with district leaders in the service of math/science improvement. 86%

District Liaisons also say:

I have been able to work successfully with our TPs. 92%

I have been a strong support and advocate for our TPs. 92%

I have been able to work successfully with other administrators in my district on behalf of ARSI and the improvement of math and science. 88%

Professional and Personal Rewards

“Quotes”

Teacher Partner as Learner

Each year the experience and knowledge base of all of the Teacher Partners grow – we continue our workshops, training, networking and staying abreast of the most valuable research for change. I had no idea how much I would learn and grow in this area when I began 8 years ago, but it has been the most valuable long-term professional development experience I can recall.

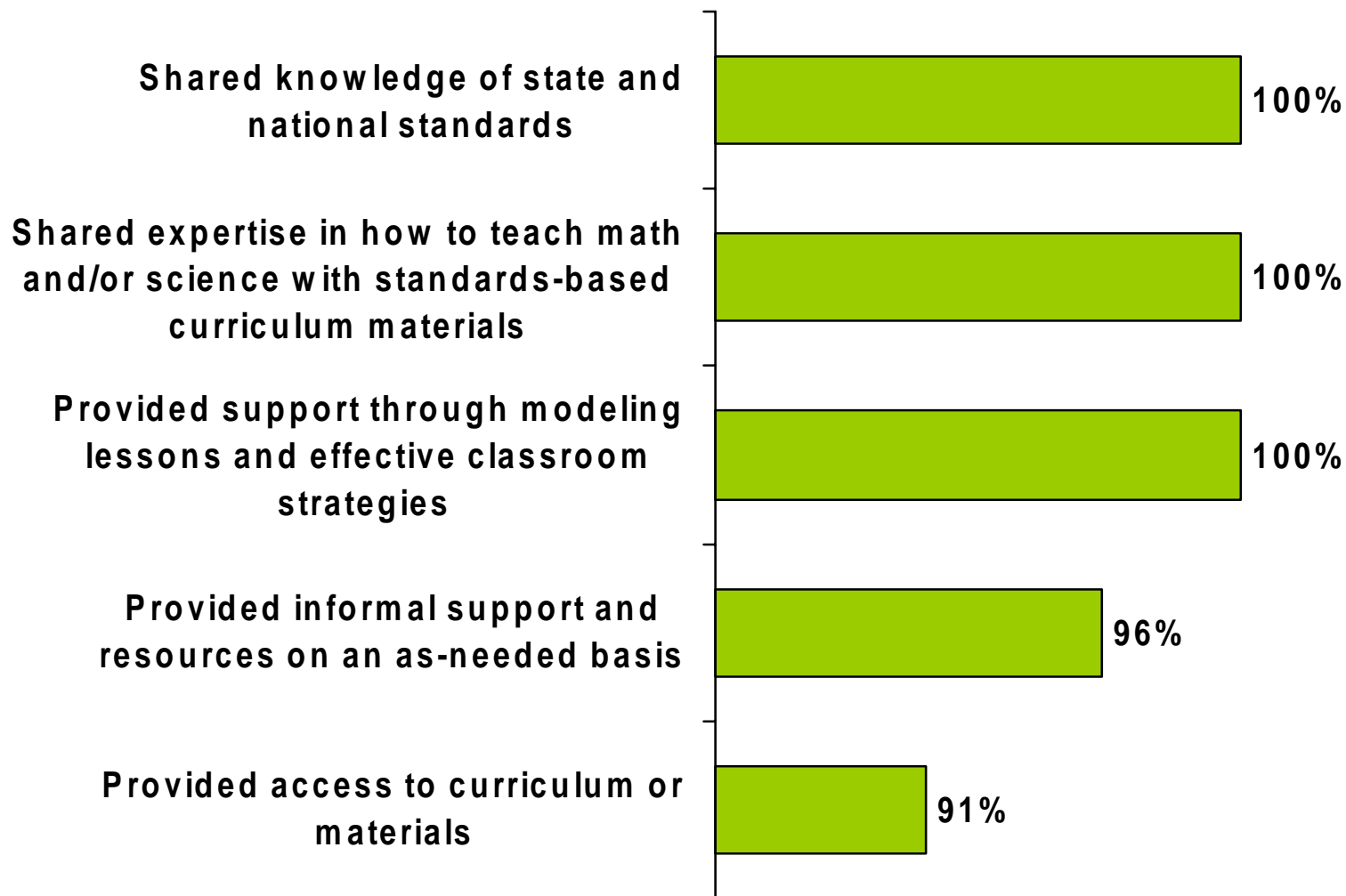
The Teacher Partner – Ever-evolving

There is no doubt that I have grown in experience, knowledge, and confidence over the last seven years. I often wonder what my district saw in me seven years ago, because I certainly was not the same person I am today. It is great to know "I am getting better."

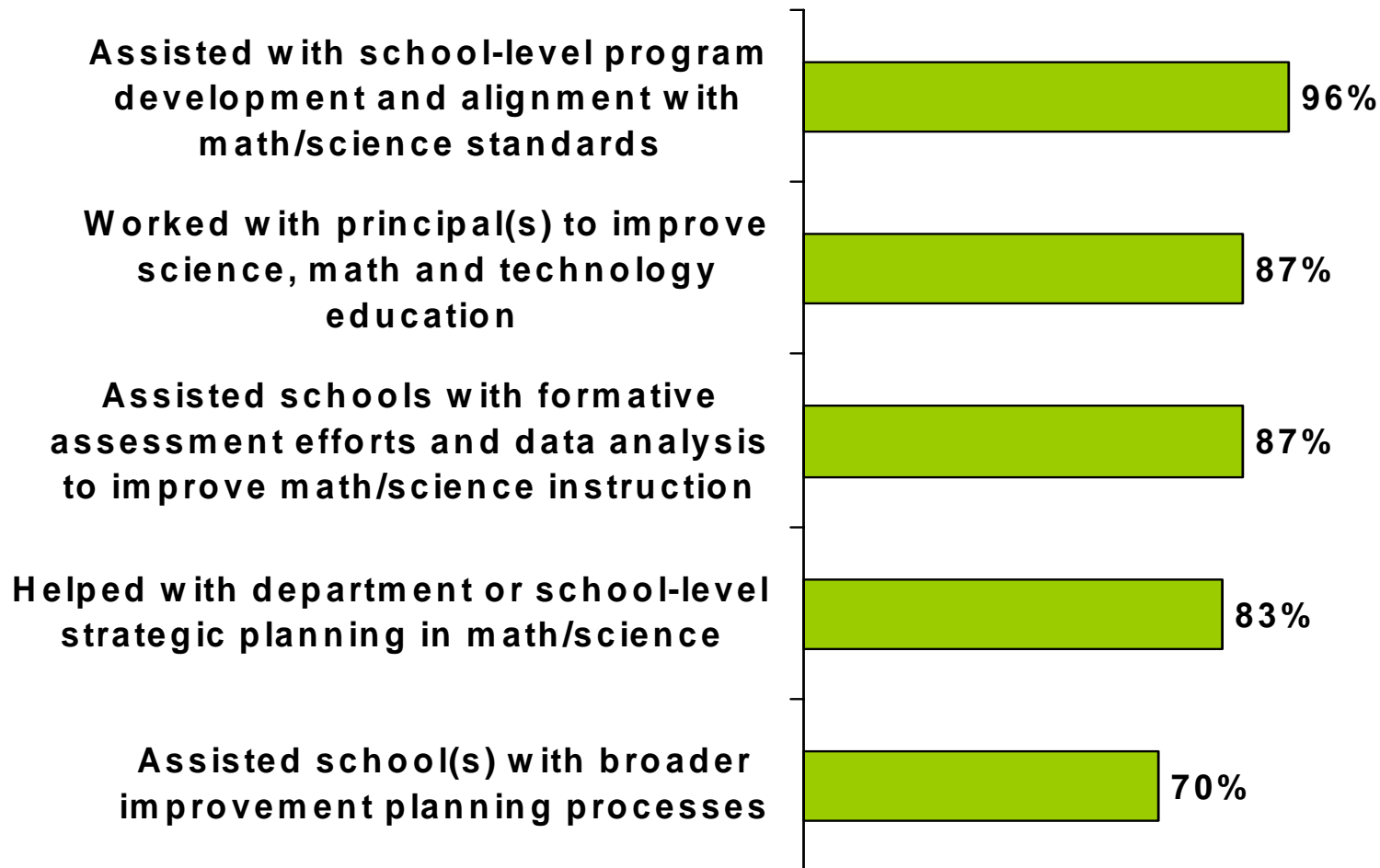
The Work and Contribution of the Teacher Partners

- Teachers
- Schools
- Districts

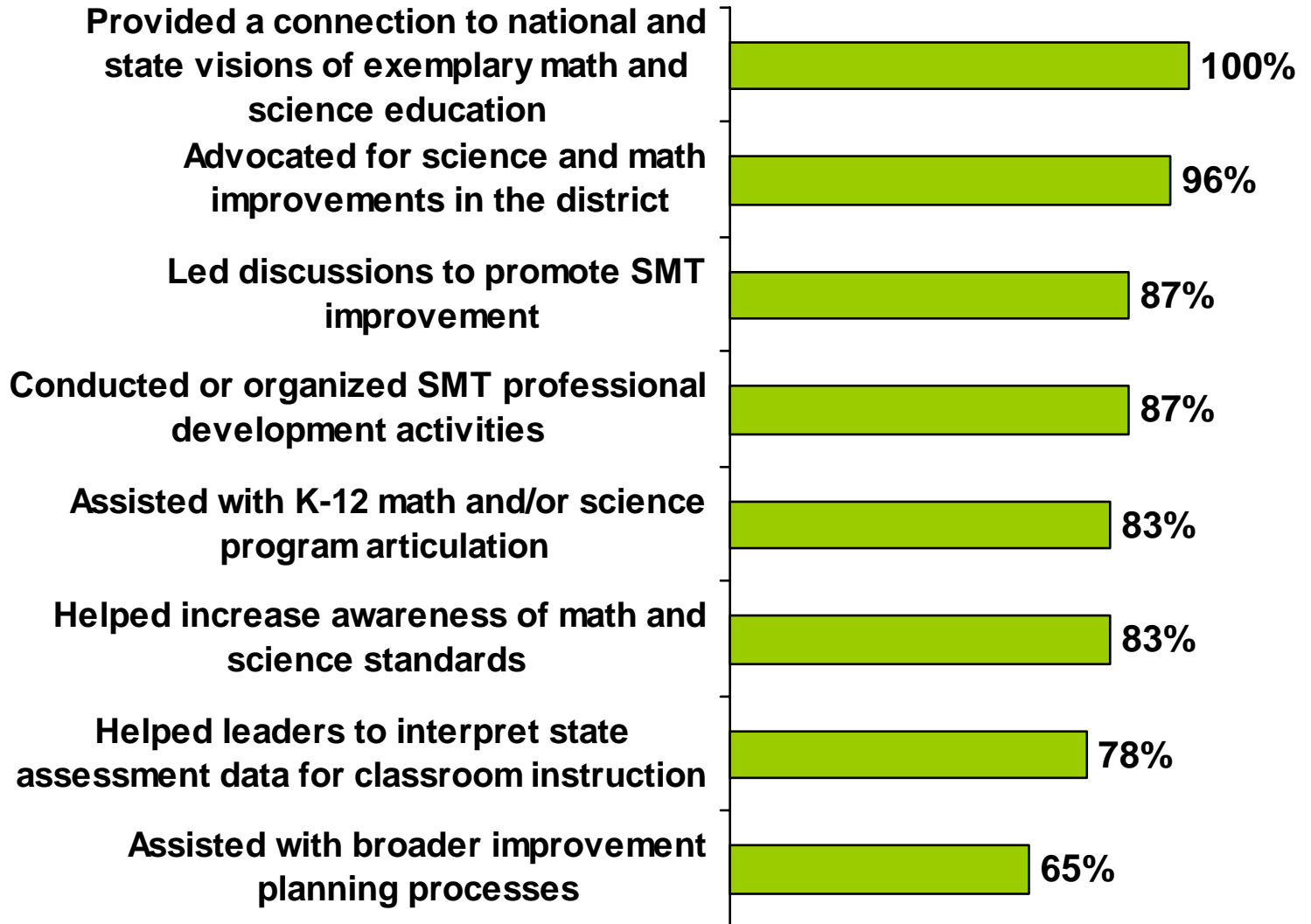
How TPs supported teachers in improving math and science teaching (% of district DLs)



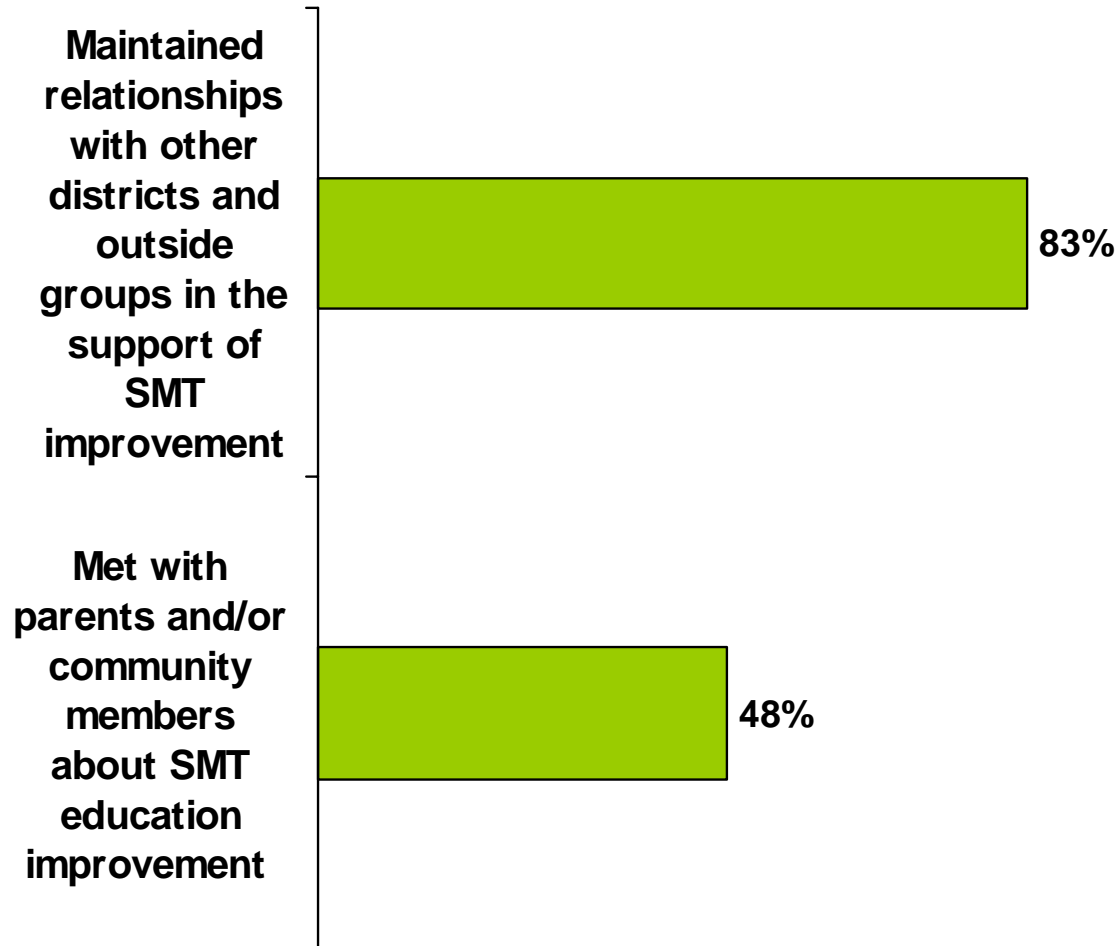
How TPs supported schools in improving math and science teaching (% of district DLs)



How TPs supported districts in improving math and science teaching (% of district DLs)



% of districts in which TPs supported other groups on behalf of ARSI



The Work of Teacher Partners

“Quotes”

The 'Partner' in Teacher Partner

Becoming a valuable partner within my county's educational structure in numerous areas – such as unit design, standards-based instruction, best practices, and data-driven decisions – is the outcome of my experience as an ARSI partner. No other word sums up my experience better than “partner:” a partner in education who supports teachers, administrators and children in our pursuit of excellence.

Ongoing Part of the School Improvement System

A one-shot workshop or professional development with outside experts can be very expensive ...and too often very little of the material becomes embedded in classroom practice and very little reaches the students.... The TP model of ongoing PD that is content-specific is, as the commercial says, “Priceless!” It is a model where real change can occur and become part of the way the schools works, rather than a temporary add-on.

Different Strokes for Different Folks

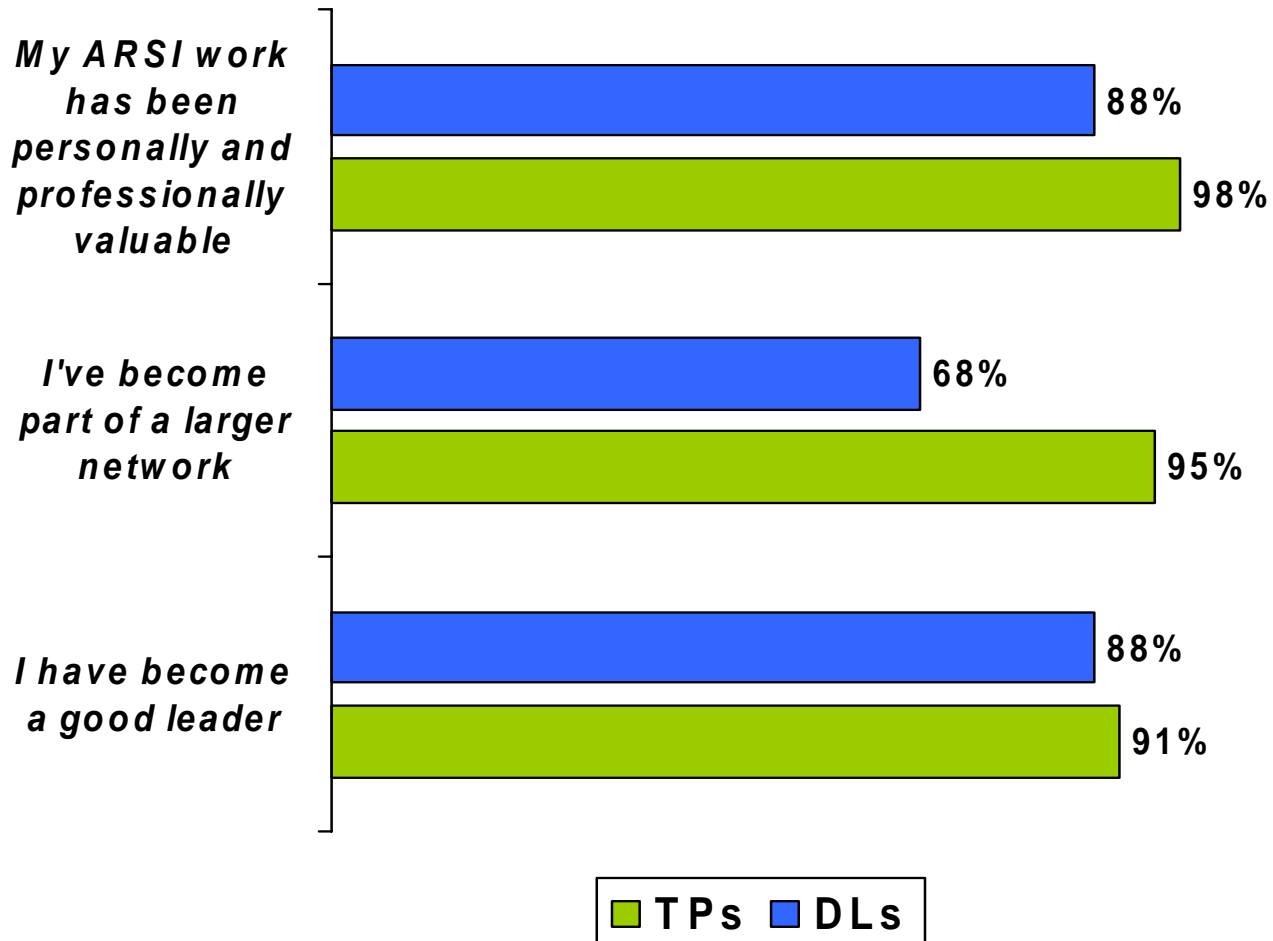
Each teacher is different in their needs and their response to change. Since all efforts are toward improvement, it is important to tailor the approach to meet those needs. Everyone (even the best) can use help, resources and new ideas. Rather than singling out those not ready for change, it was best to start with those that were. With time, patience, lots of effort and work, we now have 100% participation in efforts to improve.

Local Leadership – The Ability to Customize Improvement Efforts

Over the years, we have come to see ARSI's work with districts as developmental in nature. Just as an educator works differently with children at different stages of development, so ARSI is learning to work with counties and districts that vary tremendously in their readiness for reform.

The ARSI Network

The personal and professional benefits of ARSI participation (% of TPs and DLs)



(%s represent ratings of 4 and 5 on a 5-point scale where 1 = “disagree strongly” and 5 = “agree strongly”)

The ARSI Network

“Quotes”

Network is the Key

By yourself, you don't accomplish anything, you just can't do that. If there were only one Teacher Partner in the world and you set them out and you gave them all of the resources, he or she would still not be very effective. It is the network that makes you effective as a Teacher Partner.

Network– The End of Isolation

I have had the opportunity to meet the other TPs and talk with them about problems. I received numerous recommendations from the TPs that made much sense and were very useful. Being part of the network of TPs provided me with a communication network through which I could seek information and support at any time. Much vital information and training is now passed through this network to the Appalachian districts. If the TP network did not exist, then the districts would still be in isolation with their teachers still struggling with no outlet. The ARSI TPs provide strong leadership and are the foundation for the future success of efforts to close the achievement gap that exists in the Appalachian areas.

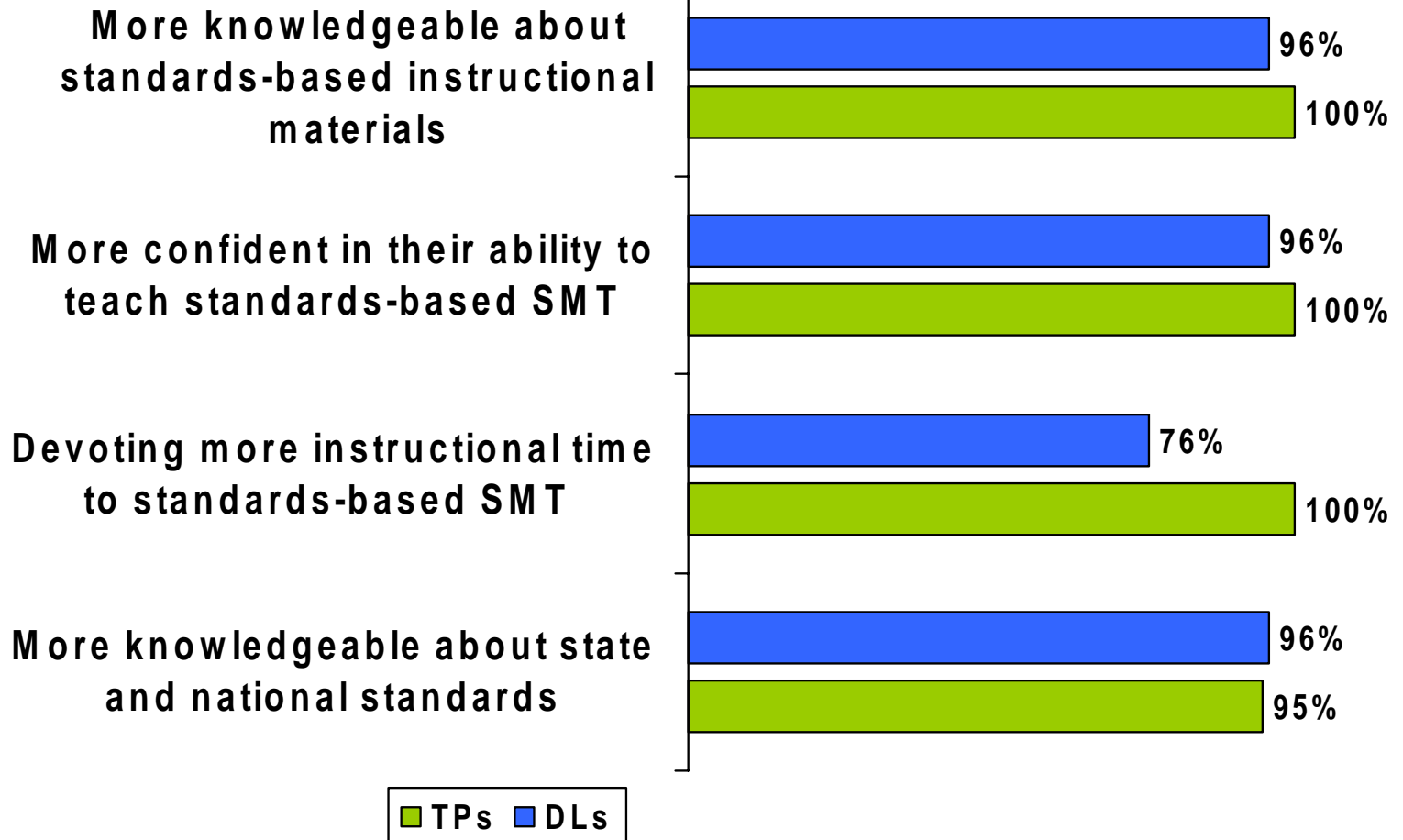
The Power of Positive Thinking

It is good to be surrounded by inspiring educators who truly believe that our Appalachian children deserve the best. The thought of change does not cause alarm for these ARSI people. They accept the challenge. I was happy to be involved with others who had a positive outlook on things rather than the negative one we so often find.

Improvements as a result of ARSI

ARSI contributions to teachers

Teachers are...



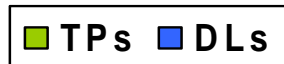
ARSI contributions to principals

Principals are...

More knowledgeable about district/state/national standards in math and science

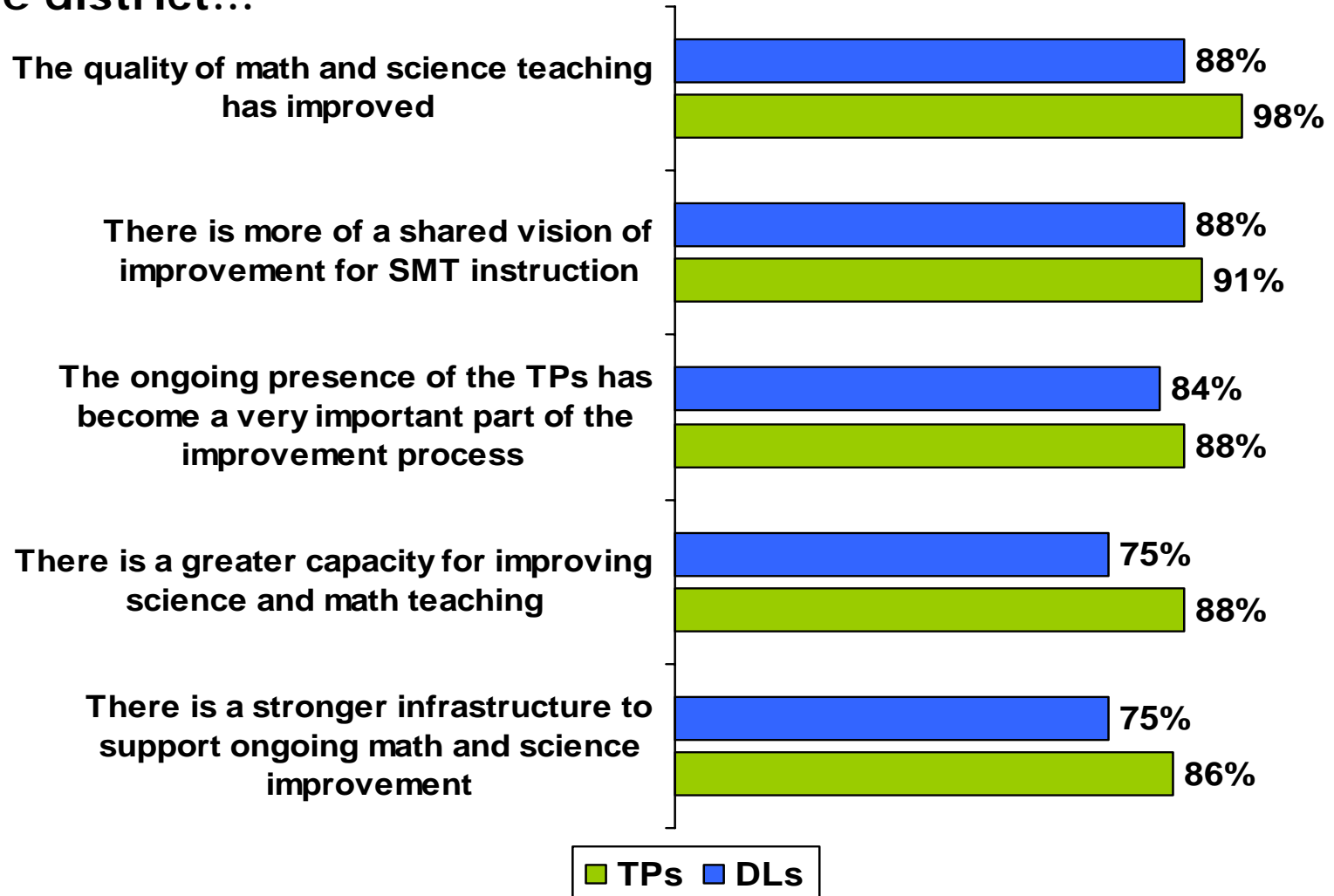


More knowledgeable about what quality SMT instruction looks like



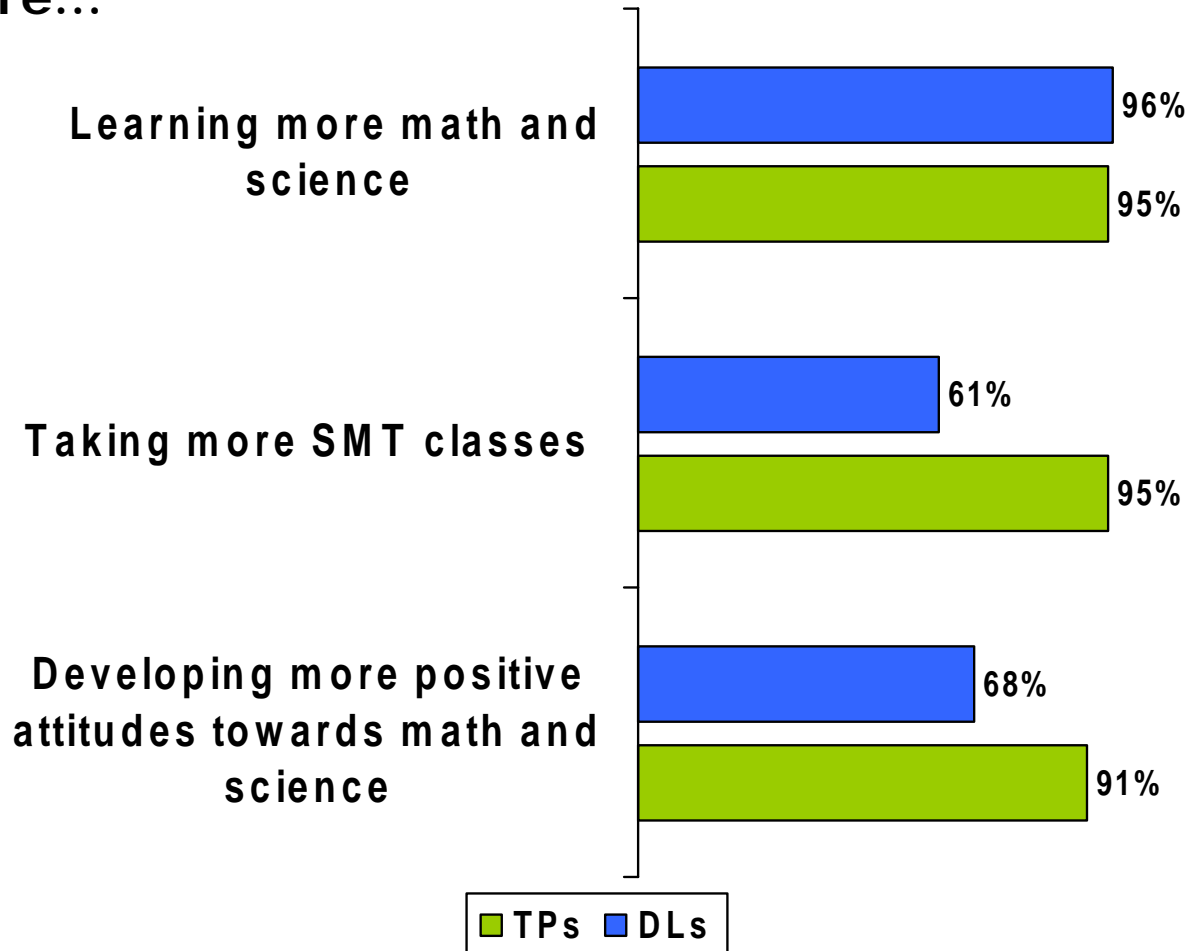
ARSI contributions at the district level

In the district...



ARSI contributions to students

Students are...



The Benefits to Students

Having a high quality teacher who has release time and the job of sharing her expertise with other teachers – what an idea! This ARSI Teacher Partner model is extraordinary. Many teachers, but more especially students, have benefited from the expertise of TPs in their classrooms. Children have become more excited about math and science because of this. When a TP walks into a classroom and the children cheer, you know that the model has impact.

Investing in ARSI

BIGGEST DISTRICT CONTRIBUTIONS

Develop and support a "point person" for math & science education reform

Develop a committed and empowered core group of people who can support and sustain reform

Create and sustain an overall positive trajectory of the math & science education reform in the district

Develop a cadre of strong math & science lead teachers

Help the district gain knowledge of and mechanisms for assessing field realities

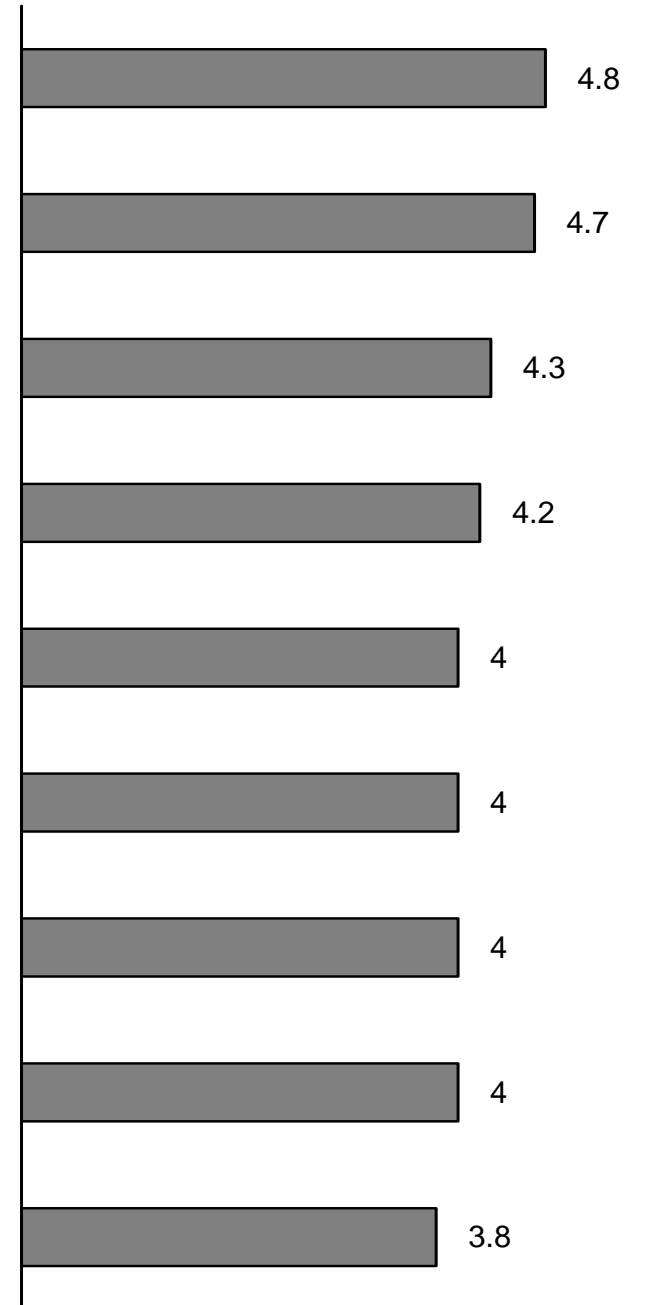
Enhance overall "seriousness" and priority that the district places on math & science education reform

Creating visible examples of success in classrooms and in the district to build upon

Assuring that the "signal-to-noise" ratio of math & science education reform in the district is strong enough to be significant

Helping to ensure that financial resources necessary to implement a district-wide program are available

ARSI influence
(mean ratings)



Investing in TPs

If a district truly wants to promote long-term change, then it should definitely invest in the training and release time for a Teacher Partner... and also time for the TP to work with teachers ...and the release time for those teachers to focus on Math and Science. Giving teachers time to “work on the work” of improving math and science will accelerate the improvement process...and it will build an infrastructure that is sustainable. Investing in teachers pays off.

THE EVALUATOR STATEMENT

ARSI represents a long-term investment in improving science and mathematics education in more than 50 of the nation's poorest rural counties. This investment has yielded returns in multiple forms. Over ten years the ARSI project has helped thousands of teachers deepen their knowledge of content and pedagogy, and improve their classroom practice. The ARSI classrooms we have observed show a quality better than the national average and equal to the classrooms of other NSF-funded projects that have been studied and documented across the country. The work of the ARSI project has also supported hundreds of schools in reviewing and improving their math and science programs. And thousands of students have benefited from the resultant enhanced opportunities to learn mathematics and science.

Perhaps most importantly, the ten years of ARSI funding have provided for the development of capacities that will allow for the continuing improvement of mathematics and science education in the Appalachian region. This capacity resides primarily in what might be called "an improvement community" consisting of Teacher Partners, District Liaisons, and Regional Collaborative Coordinators. The ARSI Teacher Partners, who include some of the region's strongest mathematics and science teachers, are collectively and individually highly skilled in assisting their local colleagues and improving their local math and science programs. The Teacher Partners, in turn, have been supported by ARSI-supported district administrators (District Liaisons), and by higher education faculty (Regional Collaborative Coordinators). Working together these members of the ARSI community represent a highly valuable working asset that is well positioned to address the ongoing need for the improvement of education within the Appalachian region.

THE EVALUATOR STATEMENT (CONTINUED)

The investment in the ARSI project has been relatively small compared to the scale of the region and the scope of the problems it has addressed. Nonetheless, the investment has yielded important returns. Because NSF provided for 10 years of steady funding, and because the work of ARSI has focused on developing capacity in a cumulative fashion, there are strong residual benefits that have accrued out of the work of ARSI. ARSI has not solved all the challenges of improving education in Appalachia, but it has put those challenges in reach of future projects. Already the AMSP and ACCLAIM projects have drawn upon ARSI-developed expertise and relationships. Because of ARSI, Appalachia is now a strong candidate for other future investments. Perhaps then, the most important legacy of ARSI will not be found in the good work it did during its lifetime, but in the work of all the future improvement efforts that draw on the assets ARSI has created.

THE EVALUATOR STATEMENT

The legacy is us!

Enduring promise going forward is us!

You are the future working assets in a region of very high needs

You make Appalachia a very good candidate for future investment

This was just a warm up!

THE NEXT TEN YEARS

- ***You have the obligation to use what you have been given...***

END