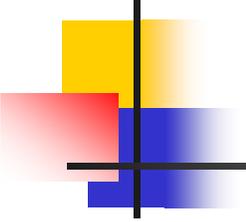


Teaching Physics in Alabama with VPLC

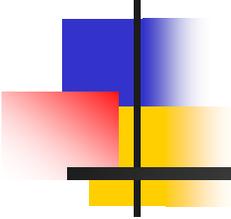
Alliance for Physics Excellence (APEX) Physics Teaching Research Program (PTR)

Dennis Sunal, JW Harrell, John Dantzler, Cynthia Sunal,
Marsha Simon, Donna Turner, and Tara Ray, and Marilyn
Stephens (PTR Team)
University of Alabama



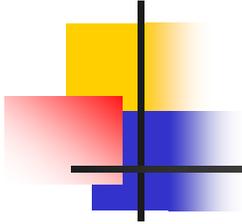
Alliance for Physics Excellence

The goal of the *Alliance for Physics Excellence* (APEX) program is to integrate research-based teaching practices into Alabama physics classrooms via in-service teacher education, and evaluate the impact on physics teachers and their students in the state's school systems.



**AS A RESULT OF THE APEX
EXPERIENCE**

**WHAT KIND OF PLACE DO I WANT
MY PHYSICS CLASSROOM TO BE
FIVE YEARS FROM
NOW?**



MISSION & VISION: What kind of transformed classroom are you trying to create?

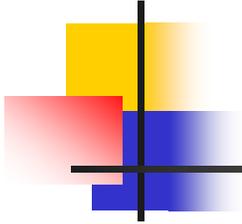
VALUES: What attitudes, behaviors, and commitments must you demonstrate in order to create the classroom of our vision?

GOALS

Which steps should we take first?

What is our timeline?

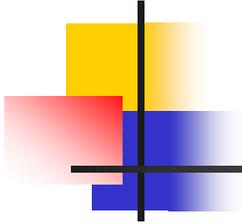
What evidence will we present to demonstrate our progress?



- **Separated by their classrooms and packed teaching schedules, teachers rarely work or talk together about teaching practices.**

Linda Darling-Hammond, 1995

- *Do you want to include this slide or just talk about it? How important is it to you for teachers to see this statement that sums up what they all know?*

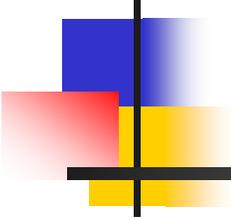


- **You cannot have students as continuous learners and effective collaborators, without teachers that have the same characteristics.**

Michael Fullan, 1993

- *Do you want to include this slide or just talk about it? How important is it to you for teachers to see this statement that sums up what they all know?*

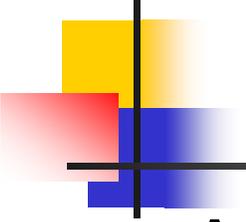
Professional Learning Communities (PLC)



Where do we begin?

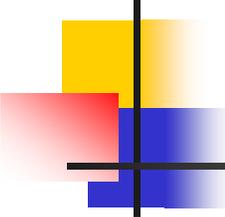
Or better still at this point

What do we do next?



What does PLC mean?

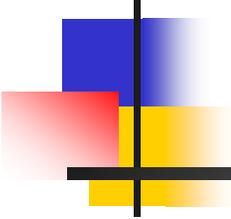
- An on going- process in which APEX educators meet regularly, share expertise, learn new ideas, and work collaboratively through collective inquiry and action research to improve teaching skills and their students' academic performance.
- PLC's operate under the assumption that the key to improved learning for students is continuous, job embedded learning.



PLCs with action research are central elements for effective professional development in any comprehensive reform initiative. As such, PLCs are grounded in two assumptions related to school improvement:

- Knowledge is situated in the day-to-day experiences of teachers and is best understood through critical reflection with others who share the same experiences. (Haar, 2003; Vescio, Ross, & Adams, 2006).
- Actively engaging teachers in PLCs will increase their professional knowledge and enhance student learning. (Vescio, Ross, & Adams, 2006).

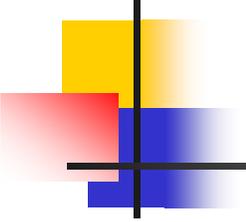
Virtual Professional Learning Community (VPLC)



What is this?

Or better still at this point

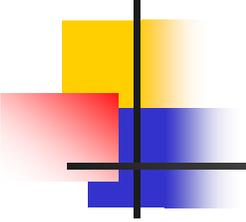
Why does it work?



APEX VIRTUAL LEARNING COMMUNITY

What is the APEX VPLC?

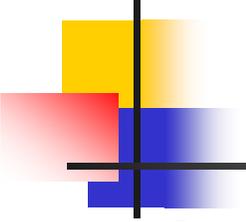
- It deploys cyber learning technologies to allow teachers to interact with one another and with experts across the state of Alabama and the nation
- Addresses the discipline of physics and an audience of APEX physics teachers and other educational researchers and stakeholders who are interested in designing enhanced professional learning opportunities for teachers.



APEX VPLC Core Concepts & Values

- **Ensuring that students learn**
 - *Learning for all*
- **A Culture of Collaboration**
 - *Teamwork*
- **Focus on Results**
 - *Data-Driven Decisions*

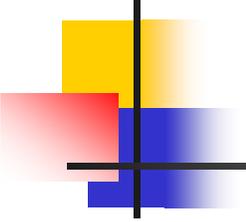
DuFour, DuFour, and Eaker (1998)



APEX VPLC Concept 1

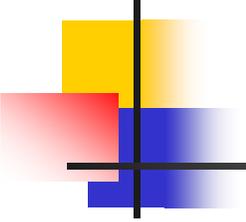
Learning

- We accept learning as the fundamental purpose of our schools/classrooms and therefore are willing to examine all practices in light of their impact on learning.
- “the fundamental purpose of the school is to ensure that all students *learn* rather than see to it that all students are *taught...*” from Raising the Bar and Closing the Gap-Whatever it Takes



Critical Questions on Learning

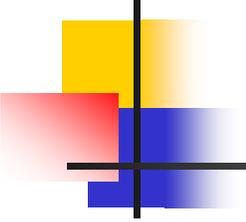
1. What is it that we expect our students to learn?
– **Objectives**
2. How will we know when our students have learned it? – **Assessment both formative and summative**
3. How will we respond when our students don't learn? - **Intervention**
4. How will we respond when our students already know it? - **Expansion**



APEX VPLC Concept 2

Collaboration

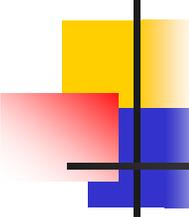
- In APEX we are committed to working together to achieve our collective purpose. We cultivate a collaborative culture through development of high-performing individuals in teams.
- Collaboration is a systematic process in which we work together, interdependently, to analyze and impact professional practice in order to improve our individual and collective results.



Why Collaborate?

- Gains in student achievement
- Higher quality solutions to problems
- Increased confidence among all
- Teachers able to support one another's strengths and accommodate weaknesses
- Greater ability to test new ideas
- More support for new teachers
- Expanded pool of ideas, materials, and methods

Judith Warren Little (1990)

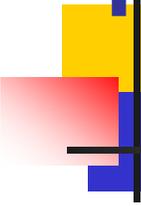


Characteristics of a Virtual Professional Learning Community

A PLC is not a model, rather, it is an approach or process. PLCs provide an infrastructure for shaping practice and assessing progress. For example;

- 1. Shared mission, vision, values, goals**
- 2. Collaborative Culture**
- 3. Collective Inquiry**
- 4. Action Orientation/Experimentation**
- 5. Commitment to Continuous Improvement**
- 6. Supportive and shared leadership**
- 7. Shared personal practice**

Characteristics of a Virtual Professional Learning Community

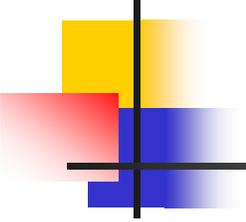


A PLC is not a model, rather, it is an approach or process. Most PLC definitions assume a set of characteristics that reflect the nature of a true PLC. An understanding of these characteristics provides educators with a shared lens through which to examine their own PLCs. They also provide an infrastructure for shaping practice and assessing progress.

1. Shared mission, vision, values, goals

What distinguishes a learning community from ordinary teachers or schools is its collective commitment to guiding principles that articulate what teachers believe and that govern their actions and behaviors.

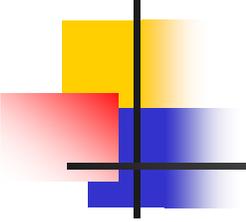
* Bolam et al., 2005; DuFour, 2004; Feger & Arruda, 2008; Hord, 1997; Kruse, Louis, & Bryk, 1994; Leo & Cowen, 2000; Louis & Kruse, 1995; Reichstetter, 2006; Stoll et al., 2006.



2. Collaborative Culture

- Professionals in a learning community work in teams that share a common purpose. They learn from each other and create the momentum that drives improvement. They build within the organization the structure and vehicles that make collaborative work and learning effective and productive.

*Bolam et al., 2005; DuFour & Eaker, 1998; Feger & Arruda, 2008; Kruse, Louis, & Bryk, 1994; Little, 1989, 2003; Reichstetter, 2006; Stoll et al., 2006.

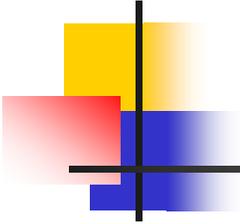


3. Collective Inquiry

Teachers in a learning community relentlessly question the status quo, seek new methods of teaching and learning, test the methods, and then reflect on the results. They;

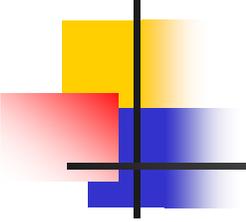
- reflect publicly on their beliefs and challenge each other's beliefs.
- share insights and hammer out common meanings.
- work jointly to plan and test actions and initiatives.
- coordinate their actions, so that the work of each individual contributes to the common effort.

*DuFour, 2004; Feger & Arruda, 2008; Kruse, Louis, & Bryk, 1994; Louis, 2006; Reichstetter, 2006; White & McIntosh, 2007.



4. Action Orientation/Experimentation

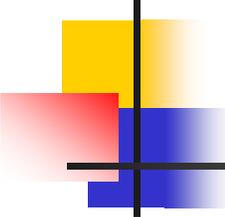
- Members of professional learning communities constantly turn their learning and insights into action. They recognize the importance of engagement and experience in learning and in testing new ideas.



5. Commitment to Continuous Improvement

Members of a learning organization are not content with the status quo and continually seek ways to bring present reality closer to future ideal. They constantly ask themselves and each other:

- What is our purpose?
- What do we hope to achieve?
- What are our strategies for improving?
- How will we assess our efforts?

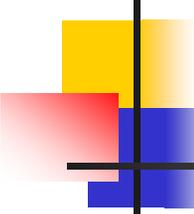


6. Supportive and shared leadership

VPLCs often are viewed as a foundation for developing teacher leaders.

- Leadership is shared and distributed among formal and informal leaders
- Teacher leadership capacity sustains VPLCs.
- Sharing authority among teachers through decision making and shared leadership increases leadership capacity and builds a belief in the teacher's collective ability to affect student learning.

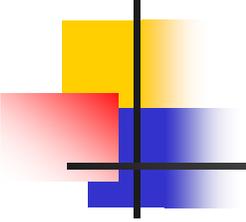
Caine & Caine, 2000; Hargreaves & Fink, 2006; Feger & Arruda, 2008; Hord, 1997; Kruse, Louis, & Bryk, 1994; Louis & Kruse, 1995; McREL, 2003; Mitchell & Sackney, 2006; Phillips, 2003; Reichstetter, 2006; Olivier & Hipp, 2006.



7. Shared personal practice

- A major focus of VPLCs is on professional learning in which teachers work and learn together as they continually evaluate the effectiveness of their practices and the needs, interests, and skills of their students
- Teachers share experiences, observe each other, and discuss teaching. Shared practice and collective inquiry help sustain improvement by strengthening connections among teachers, stimulating discussion about professional practice, and helping teachers build on one another's expertise
- Through continuous inquiry and reflective dialogue teachers discover solutions and address student needs

Hord, 1997; Kruse, Louis, & Bryk, 1994; Thompson, Gregg, & Niska, 2004; McREL, 2003; Stoll et al., 2006.



APEX VPLC Concept 3

Results

Professionals in a VPLC recognize that no matter how well-intentioned the efforts, the only valid judgment of improvement is observable and measurable results, formative and summative data. Four habits of highly effective teams are

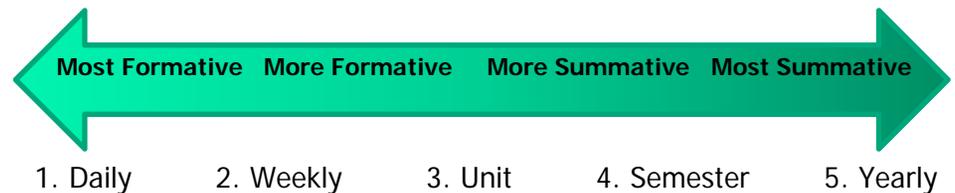
1. collective inquiry,
2. action orientation and experimentation,
3. commitment to continuous improvement, and
4. results orientation.

How do we determine what worked?- The best available evidence of positive impact on student learning is ongoing assessment.

Keys to Formative Assessment

- used to identify students who are experiencing difficulty in their learning?
- students who are having difficulty are provided with additional time and support for learning?
- students are given an additional opportunity to demonstrate their learning?

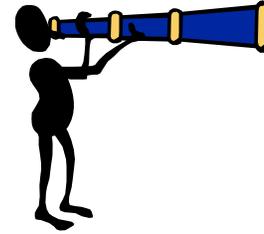
Assessment Continuum



Assessment Timeline

1. Diagnostic and prescriptive
2. Identify students eligible for support
3. Calibrate and pace the curriculum
4. Rank and benchmark entrance and exit criteria

Changing the Focus

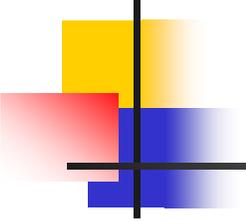


Old Focus

- Every student can learn
- Focus on teaching
- Isolation
- Assessment OF learning (Summative)
- Failure is an option

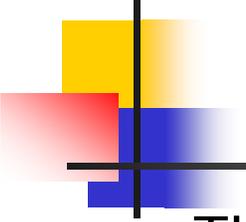
New Focus

- ■ Every student will learn
- ■ Focus on learning
- ■ Collaboration
- ■ Assessment FOR learning (Formative)
- ■ Failure is not and option



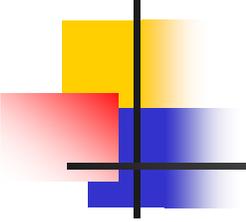
Culture Shifts in a VPLC

- **Shift in Fundamental Purpose**
..... **From teaching to learning**
- **Shift in Use of Assessments**
..... **From summative to frequent formative**
- **Shift in the Work of Teachers**
..... **From isolation to collaboration using a Learner-Learner model**
- **Shift in Response When Students Don't Learn**
..... **From remediation to intervention**



The Learner-Learner Model

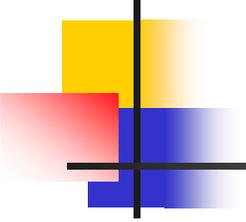
- This L-L model enables learners to collaboratively co-construct meaning of concepts using technology as a conduit for shared knowledge development (Vygotsky 1978 and Knowles 1980)
- VPLC is based on the L-L model and supports a collaboration platform and professional learning by providing the organizational and process structure that brings two or more participants together to learn through shared decision making, peer interactions, reflections, and performance expectations.



Why L-L Model Works

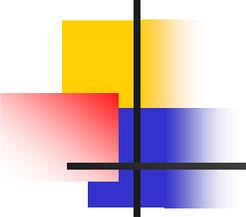
- Knowledge is a human product which is socially and culturally constructed.
- Individuals construct meaning through their interactions with each other and with the environment they live in.
- Individual knowledge does not get passed down.
- Meaning learning occurs when individuals are engaged in social activities.

Ernest 1999, Gredler 1997, Prawat & Floden 1994, Kukla 2000, McMahon 1997



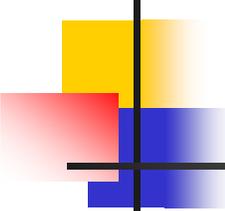
VPLC Organization and Process

- **What actions are needed to getting it started?**
- **What is needed for a VPLC?**
- **What is the potential payoff? and Why it works?**



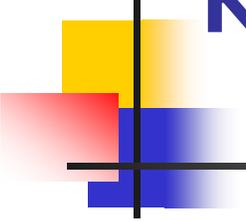
Steps to Setting Up a Virtual Learning Community

1. Transition from face-to-face to a complementary online virtual learning community – APEX VPLC
2. Learning to manage the virtual environment with a small group of peers
3. Establish team short term goal(s) (incremental best) by beginning group problem finding
4. Embed collaboration with a focus on learning practices and strategies for the physics classroom.
5. Schedule time for collaboration in the school day and on the school calendar.
6. Focus team on critical questions.



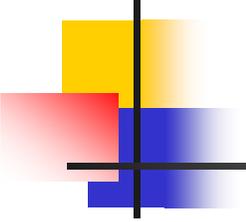
VPLC Team Actions Include

- 1) group discussion, reflection, and observation
- 2) reciprocal teaching
- 3) peer collaboration and cooperative learning
- 4) peer coaching
- 3) cognitive apprenticeships
- 4) student centered rather than content centered
- 5) other methods that involve learning with others producing transformational change among teachers



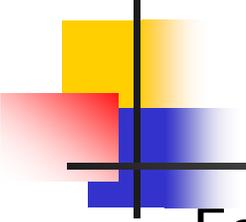
Keys to Collaboration in a VPLC

7. Conduct regular action research on new or old learning/teaching strategies and curricular changes.
8. Make products of collaboration explicit.
9. Establish **team norms** to guide collaboration
10. Experts provide teams with frequent access to relevant information.
11. Pursue specific & measurable team performance goals.
12. Schedule regular assessment of formative and summative processes and products.
13. Review group progress and new goals continuously.



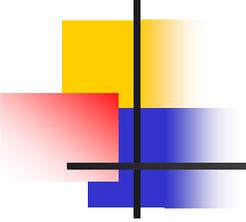
Why Team Norms?

- Team norms of a group help determine whether it functions as a high-performing team or becomes simply a loose collection of people working together.
- Positive norms will stick only if the group puts them into practice over and over again. Being explicit about norms raises the level of effectiveness, maximizes emotional intelligence, produces a positive experience for group members, and helps to socialize newcomers into the group quickly.



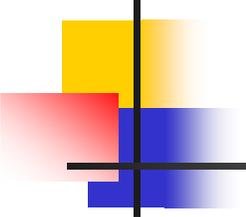
TIPS for Team Norms

- Each team establishes its own norms.
- Norms are stated as commitments to act or behave in certain ways.
- Norms are reviewed at the beginning and end of each meeting until they are internalized.
- One norm requires team to self-assess its effectiveness every six months. This formative assessment should include a review of adherence to norms and the need to identify new norms.
- Less is more. A few key norms are better than a laundry list.
- Violations of norms must be addressed.



Sample Team Norms

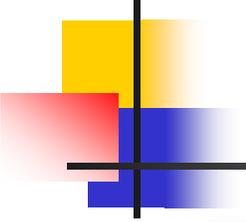
- Planned agendas and prepared materials
- Note-taking and minutes
- Sticking to the task
- Short term goal- month or semester
- Formative self-assessment schedule – group metacognitive task
- ...



Getting it Done

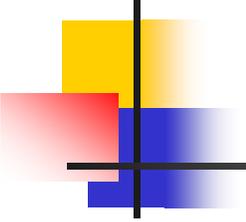
The overall goal of the APEX VPLC is building capacity and sustainability during and after APEX.

- This can be measured by
 - APEX teachers' sustained participation in the VPLC
 - Changes in APEX teachers' "professional vision" while using the VPLC
 - APEX teachers willingness and ability to become leaders in Alabama in physics education.



APEX Website

- The URL for the APEX website is:
 - apex.ua.edu
 - APEX Cohort 1 is a page specifically for information for cohort 1 participants.
 - Blog – is a blog site for questions and comments about physics, physics lessons, and the APEX workshops that are to be shared with other cohort 1 members and the University of Alabama content area specialist.
 - Sites are password protected. The password is:
Cohort1



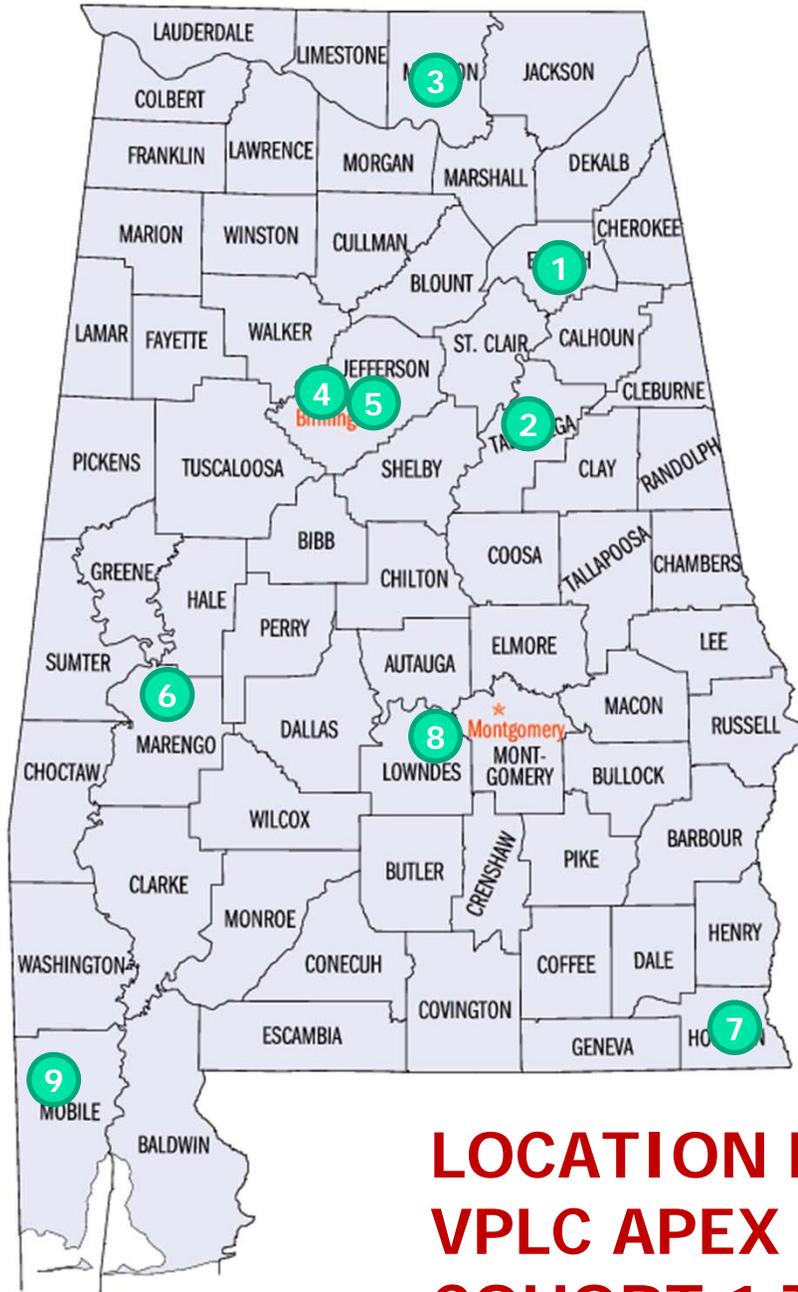
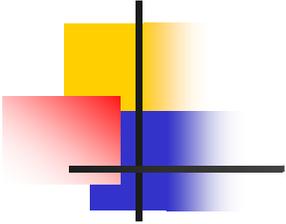
VPLC Teams Teaching Physics during spring 2015

APEX VPLC Group 1

1. Christina Caldwell
2. David Hall
3. Mark Maddox
4. Angela McLeod
5. Mara Johnson

APEX VPLC Group 1

6. Cynthia Phillips
7. Angela Olguin
8. Rochelle Williams
9. Timothy Williams



Teacher

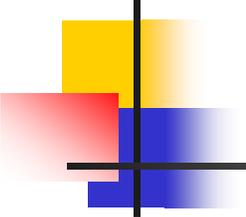
Group 1

- 1 C. Caldwell
- 2 D. Hall
- 3 M. Maddox
- 4 A. McLeod
- 5 M. Johnson

Group 2

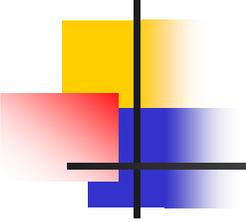
- 6 C. Phillips
- 7 A. Olguin
- 8 R. Williams
- 9 T. Williams

**LOCATION MAP OF
VPLC APEX
COHORT 1 TEACHERS**



Identifying VPLC Benefits

- A VPLC contributes to instructional improvement and school reform (Annenberg, n.d.; Little, 2003)
- VPLCs are effective when their purpose is to enhance teacher effectiveness for the ultimate benefit of student learning (Stoll et al., 2006).
- Sustained school improvement efforts have been attributed to VPLCs (DuFour & Eaker, 1998).
- Teacher benefits have been documented (Hord, 1997)

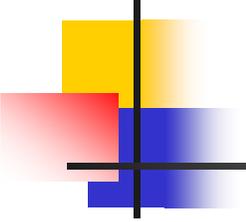


Teacher Benefits With VPLCs

By participating in VPLCs, teachers experience a variety of benefits that contribute to improved student achievement, including:

- Reduction of isolation
- Increased commitment to the mission and goals of the school
- Shared responsibility for student success
- Greater job satisfaction and higher morale
- Lower rates of absenteeism (Hord, 1997)

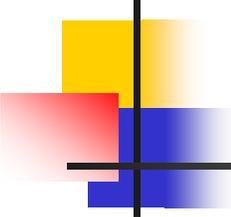
Confirming VPLC Characteristics

- 
- Three themes:
 - 1) proactive administrator and teacher leadership,
 - 2) purposeful decision making, and
 - 3) job-embedded professional development (Huffman, Hipp, Pankake, & Moller, 2001).
 - A strong vision that is connected to student learning and continuous improvement (Bolam et al., 2005).
 - Shared vision is evident in more established PLCs (Huffman, 2003).
 - Shared leadership structures, including opportunities to build teacher leadership capacity, are more evident in schools that have more developed PLCs (Moller, 2006).

Assessing VPLC Impact on Student Performance

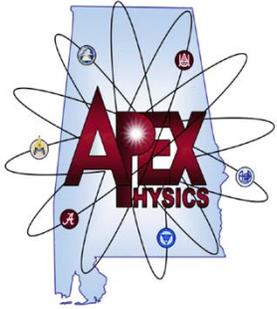
Sample research studies show:

- over 90 percent of schools (n=64) in one study reported an increase in standardized scores while functioning as a PLC for 2.5 years (Hughes & Kritsonis, 2007)
- in another study, it was concluded that an explicit focus on instructional improvement is necessary for PLCs to have a positive impact on improving teaching and learning. Without such focus, PLCs may have a positive effect on culture and teachers' feelings of well-being, but not necessarily on student achievement. (Supovitz (2002)



Resources

- DuFour, R., & Eaker, R. (1998). *Professional learning communities at work: Best practices for enhancing student achievement*. Bloomington, IN: Solution Tree.
- DuFour, R. (2004). What is a professional learning community? *Educational Leadership*, 61(8), 6-11.
- DuFour, R., DuFour, R., Eaker, R., & Many, T. (2006). *Learning by doing: A handbook for professional learning communities that work*. Bloomington, IN: Solution Tree.
- www.allthingsassessment.info
- <http://go.solution-tree.com/PLCbooks>



Teaching Physics in Alabama

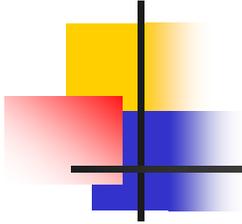
Alliance for Physics Excellence (APEX) Physics Teaching Research Program (PTR)

Dennis Sunal, JW Harrell, John Dantzler, Cynthia Sunal,
Marsha Simon, Donna Turner, and Tara Ray, and Marilyn
Stephens (PTR Team)
University of Alabama

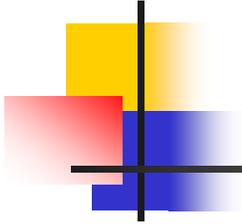
Definitions:

professional learning community

- A “professional” is someone with expertise in a specialized field, an individual who has not only pursued advanced training to enter the field and had extensive in-field experience, but is one who is also expected to remain current in its evolving knowledge base.
- The “knowledge base” of education has expanded dramatically in the past quarter century, both in terms of research and in terms of the articulation of standards for the profession. Although many school personnel are unaware of or are inattentive to emerging research and standards, educators in a VPLC make these findings the basis of their collaborative investigation of how they can better achieve their goals.

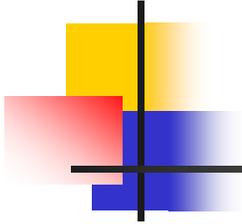


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- “Learning” suggests ongoing action research and perpetual curiosity. Many schools operate as though their personnel know everything they will ever need to know the day they enter the profession. The school that operates as a professional learning community recognizes that its members must engage in the ongoing study and constant practice that characterize an organization committed to continuous improvement.



- The term “community” suggests a group linked by common interests. Community means different things to different people. To some it is a safe haven where survival is assured through mutual cooperation. To others, it is a place of emotional support, with deep sharing and bonding with close friends. Some see community as an intense crucible for personal growth. For others, it is simply a place to pioneer their dreams.”

Corrine McLaughlin and Gordon Davidson (1994)



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- In a “professional learning community”, all of these characteristics are evident. Educators create an environment that fosters mutual cooperation, emotional support, and personal growth as they work together to achieve what they cannot accomplish alone.