

## Part I: First Steps in Preparing for College Level Math: Using Soft Skills

Presented by: Connie Rivera  
ACE 2017 Fall Conference  
October 13, 2017

### Objectives of the workshop

- Gain an understanding of why preparation for college-level math is needed by connecting 21<sup>st</sup> century skills and workplace skills to college readiness skills.
- Gain an understanding of math-specific and general barriers and challenges facing adult learners.
- Gain an understanding of instructional strategies.

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### Why should you visit LINC'S regularly?

**LINC'S provides you with the information, resources, activities, and network you need to enhance your practice in order to provide your students with high-quality learning opportunities.**



Visit LINC'S: <http://lincs.ed.gov/>

LINC'S is funded by the U.S. Department of Education - Office of Career, Technical, and Adult Education. It is comprised of the Resource Collection, the Community of Practice, and the National Professional Development Center.

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### LINC'S makes a difference

How can LINC'S help you with your work? It offers:

- A **Resource Collection** containing high-quality, evidence-based materials in 16 topic areas critical to the field
- An online **Community of Practice** where you can share knowledge and collaborate with your peers
- A **Learning Portal** where you can engage in self-paced and facilitated professional development courses
- A **LINC'S Professional Development Center** that deploy evidenced-based PD trainings to states

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### Don't miss a beat; create a LINC'S account

- Participate in the **Community**: <https://community.lincs.ed.gov>
- Access the **Learning Portal**: <http://lincs.ed.gov/courses>
- Search the **Resource Collection**: <http://lincs.ed.gov/collections>
- Follow the latest updates: @LINC'S\_ED  @Rivera\_Con
- Join our professional group: LINC'S\_ED 
- Watch webinar archives and more: Linc'sEd 

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### Program for the International Assessment of Adult Competencies (PIAAC)



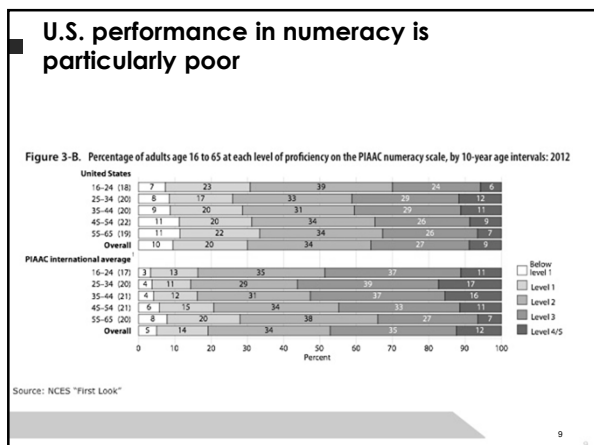
Watch the PIAAC Overview:  
[https://www.youtube.com/watch?v=p\\_iCyWkVGUM&feature=youtu.be](https://www.youtube.com/watch?v=p_iCyWkVGUM&feature=youtu.be)

### What is PIAAC?

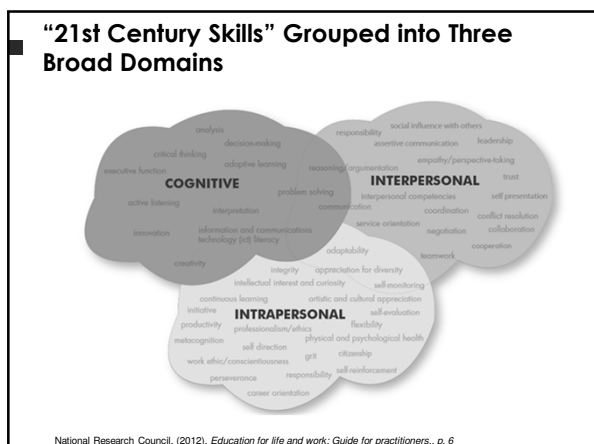
- PIAAC is an international large-scale assessment administered in 2011-12 in 24 countries including the United States
- Organized by the Organization for Economic Cooperation & Development (OECD)
- It assessed 16 - to 65-year-olds, non-institutionalized, residing in each country, irrespective of nationality, citizenship, or language status
- Administered to a sample of about 5,000 adults on either laptop computer or paper-and-pencil
- Results from the first round of PIAAC were released in 2013
- In 2013-14, the United States supplemented its original sample with 3,660 more adults, oversampled:
  - Unemployed (age 16-65)
  - Young adults (age 16-34)
  - Older adults (age 66-74)

This PowerPoint was developed by AIR

### PIAAC Results:



### What skills should students have to be successful in college?



**21<sup>st</sup> century skills – deeper learning**

- Being able to transfer learning to new situations
- Learning goes beyond rote memorization of facts and procedures
- Understanding when, how, and why to apply learning to solve new situations
- Through the process of deeper learning, students develop 21<sup>st</sup> century competencies

National Research Council. (2012). Education for life and work: Guide for practitioners

**What are the barriers that students face transitioning from HSE tests and into a college level math class?**

**Barriers that adults face transitioning from HSE to college level math**

- College placement tests
- Weak arithmetic skills
- Still weaker algebraic skills
- Math phobia
- Poor math self esteem
- Lacking self advocacy
- Poor reading skills especially in solving word problems


**Peer interviews**  
The best of times... the worst of times

**Brainstorm: safe classroom**

How can you make your classroom a safe place for learning?



**Goal setting using force field analysis**



**Barriers**

Who or what would keep you from completing this math course?

**Positive forces**

Who or what would help you to complete your goal of completing this class?

**Action Steps**

The significant *action steps* I need to take in order to meet my math success goal(s) are:

Action Steps

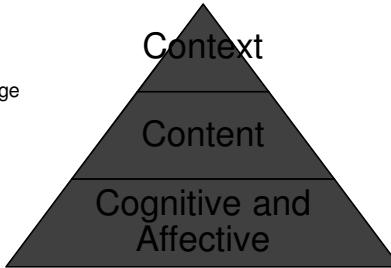
1.
2.
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**The components of numeracy - three components that inform instruction**

**Context** – use and purpose of task

**Content** – knowledge necessary to complete mathematical tasks

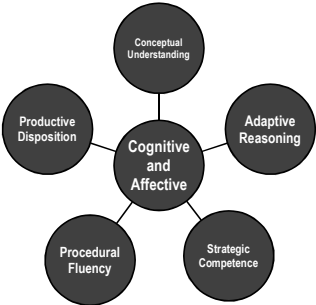
**Cognitive and Affective** – processes that enable an individual to solve problems



Ginsburg, L., Manly, M., & Schmitt, M. J. (2006). The components of numeracy. NCSALL occasional paper.

**Cognitive and affective component**

There are five subcomponents that relate to adult numeracy learning and behavior



Ginsburg, L., Manly, M., & Schmitt, M. J. (2006). The components of numeracy. NCSALL occasional paper

**The mathematical practices**

1. Make sense of problems and *persevere in solving them*.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Career and College Readiness Standards for Adult Education: Key Skills and Mathematical practices no. 44-50

### ■ Math anxiety

### ■ Math alphabet soup activity

### ■ Productive disposition

- Includes “the beliefs, attitudes, and emotions that contribute to a person’s ability and willingness to engage, use, and persevere in mathematical thinking and learning.”\*
- It is important to address math anxiety and bolster a student’s confidence in their ability to do mathematics

\* *The Components of Numeracy*, p. 30

### ■ Student testimonial

***“First I would like to thank you for giving me a chance to practice/improve my math skills. Your understanding and patience made it possible to relate and understand math. Not only improving my math, I’ve gained other skills as well. Motivation, determination, confidence and much more. All these skills will follow/practice as I enter college and also through out life. Thank you!”\****

\* Female student from Pam Meader’s class, June 2013.

### ■ Problem solving

- **Teaching for problem solving**  
— teaching skills, then providing problems to practice those skills
- **Teaching about problem solving**  
— teaching strategies
- **Teaching through problem solving**  
— teaching content through problems

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### ■ A shift in the role of problems

- Good problems start with ideas that students already have.
- Students learn mathematics as a result of problem solving.
- Students are learning mathematics by doing math!

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**Why problem solving is important**

*“In a class discussion or on a problem-solving team, bringing together different viewpoints and experiences makes everyone think harder and provide better evidence for their opinions.”*

*Katherine Phillips*

http://ww2.kqed.org/mindshift/2016/02/29/research-shows-diverse-classrooms-improve-learning-for-everyone/

**Teacher testimonial**

*“I tell my students this over and over again: look at different ways and adapt them to how you think. There are many pathways, and sometimes there are many answers to a single problem. The quest is in the process, not the answer. The process is what reflects how we individually take information in, organize it, and process it.”*

*Deborah Shriver, ABE/HSE math instructor and ABE Program Manager, Centralia College, Washington state*

**Reflections**

- What resonated with you?
- What activities might you try in your classroom?
- What concerns or questions do you have?
- What are your next steps?

**collegetransition.org**



**adulnumeracynetwork.org**



**What is ANN?**

We are a community dedicated to quality mathematics instruction at the adult level. We support each other, we encourage collaboration and leadership, and we influence policy and practice in adult math instruction.

**Please complete the LINCS evaluation before leaving**

Connie Rivera

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