

Are We Really Teaching Numeracy?

Problem Statement

We are a group of teachers investigating adult numeracy (TIAN). But what is numeracy? Is it different from math? A paper was published recently that considers what numeracy includes. The authors examined a host of documents and concluded that numeracy is MORE than math, that it has three distinct yet intertwining components: context, math content, and cognitive/affective factors. Numeracy, defined this way, has not found its way into mainstream adult ed classrooms. Should it? If so, what would it take to make that happen? Read the excerpt below from this article and consider the accompanying questions with your regional or local group.

Suggested advance readings

“The Components of Numeracy” (especially the summary on p. 34)

http://www.ncsall.net/fileadmin/resources/research/op_numeracy.pdf

The Adult Numeracy Network’s “Teaching and Learning Principles” and “Professional Development Principles.”

[http://www.literacynet.org/ann/teachingandlearningprinciplesv610.30.05%20\(newest\).pdf](http://www.literacynet.org/ann/teachingandlearningprinciplesv610.30.05%20(newest).pdf)

To gain insight into the importance of numeracy or quantitative literacy in today’s society, select a few chapters that interest you from “Mathematics and Democracy: The Case for Quantitative Literacy.”

<http://www.maa.org/ql/mathanddemocracy.html>

Components and Subcomponents of Numeracy

CONTEXT – the use and purpose for which an adult takes on a task with mathematical demands

Family or Personal—as a parent, household manager, consumer, financial and health-care decision maker, and hobbyist

Workplace—as a worker able to perform tasks on the job and to be prepared to adapt to new employment demands

Further Learning—as one interested in the more formal aspects of mathematics necessary for further education or training

Community—as a citizen making interpretations of social situations with mathematical aspects such as the environment, crime and politics

CONTENT – the mathematical knowledge that is necessary for the tasks confronted

Number and Operation Sense—a sense of how numbers and operations work and how they relate to the world situations that they represent

Patterns, Functions and Algebra—an ability to analyze relationships and change among quantities, generalize and represent them in different ways, and develop solution methods based on the properties of numbers, operations and equations

Measurement and Shape—knowledge of the attributes of shapes, how to estimate and/or determine the measure of these attributes directly or indirectly, and how to reason spatially

Data, Statistics and Probability—the ability to describe populations, deal with uncertainty, assess claims, and make decisions thoughtfully

COGNITIVE AND AFFECTIVE—the processes that enable an individual to solve problems and, thereby, link the content and the context

Conceptual Understanding—an integrated and functional grasp of mathematical ideas

Adaptive Reasoning—the capacity to think logically about the relationships among concepts and situations

Strategic Competence—the ability to formulate mathematical problems, represent them, and solve them

Procedural Fluency—the ability to perform calculations efficiently and accurately by using paper and pencil procedures, mental mathematics, estimation techniques, and technological aids

Productive Disposition—the beliefs, attitudes, and emotions that contribute to a person's ability and willingness to engage, use, and persevere in mathematical thinking and learning or in activities with numeracy aspects

From Ginsburg, L., Manly, M., and Schmitt, M. J. (2006). *The components of numeracy* [NCSALL Occasional Paper]. Cambridge, MA: National Center for Study of Adult Literacy and Learning. Available: http://www.ncsall.net/fileadmin/resources/research/op_numeracy.pdf

Questions to Guide Discussions

Discuss these questions in local or regional groups

1. According to the paper, numeracy has three components: context, content, and cognitive and affective factors. And each of those components has sub-components. How well does your teaching reflect those?
2. How well do your state mandated assessments and state standards reflect those components?
3. What do effective approaches to teaching numeracy look like?
4. Most tests that are used in adult education and for college placement focus mainly on skills. How does teaching numeracy with all its components prepare adults for such tests?
5. The Components of Numeracy paper suggests that numeracy is a complex proficiency that involves the intertwining of multiple skills and understandings. How do you recognize growth in something like conceptual understanding? In other words, what would a complete numeracy assessment look like?
6. For which of the numeracy components and subcomponents are we good at helping students make growth? Which are we not?