Towards a Common European Numeracy Framework for Adults

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Today’s program

- Project Context
- Societal context
- Brainstorm key ingredients
- Discussion
Project Context

- Erasmus+ (Granted on 19th July 2018 !!)
- 4 Institutes
  - HU University of Applied Sciences Utrecht
  - Berufsforderungsinstitut Öberosterreich (BFI-ÖO), Linz
  - University of Barcelona
  - University of Limerick
- 32 months project from dec 2018 – sep 2021 to combine professional development of adult numeracy teachers and volunteers with the development of a (tentative) Common European Numeracy Framework for Adults.
The project aims to improve the professional development opportunities available for adult numeracy teachers and volunteers all over Europe, through the development of a Common European Numeracy Framework (CENF) and a set of modules for the Professional Development (PDM) of teachers and volunteers in adult numeracy education.
The societal context

- Being a “full” citizen in our societies

Metrics such as social improvement, transferability to diverse populations or social contexts, are also used to back research proposals. Nature 528,193 (Dec.2015)

Marta Soler-Gallart. Member of the SIS2016 Scientific Committee.
The societal context

- Adult numeracy to be part of our society
The conceptual context

- Dialogic turn – Dialogic societies (Flecha, 2000)
Previous research contributions

Definition of literacy and numeracy

“Numeracy was defined in ALL as the knowledge and skills required to manage mathematical demands of diverse situations.”

What is the price per can during the sale?

6 pack Coca-Cola
$1.80
was $2.25
Previous research contributions

- Development of a framework for key competencies in a knowledge-based society
  - Mathematics literacy
- Definition of numeracy and numerate behavior
- Learning and teaching in adult education
# Mathematics literacy

## FRAMEWORK FOR KEY COMPETENCES IN A KNOWLEDGE-BASED SOCIETY

### 3.1. Mathematical literacy

The competence consists of the following elements of knowledge, skills and attitudes as appropriate to the context:

<table>
<thead>
<tr>
<th>Definition of the competence</th>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
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| At the most basic level, mathematical literacy comprises the use of addition and subtraction, multiplication and division, percentages and ratios in mental and written computation for problem-solving purposes | Sound knowledge and understanding of numbers and measures and the ability to use them in a variety of everyday contexts is a foundation skill that comprises the basic computation methods and an understanding of elementary forms of mathematical presentation such as graphs, formulas and statistics. | Ability to apply the basic elements of mathematical literacy such as:  
- addition and subtraction;  
- multiplication and division;  
- percentages and ratios;  
- weights and measures to approach and solve problems in everyday life, e.g.:  
  - managing a household budget (equating income to expenditure, planning ahead, saving);  
  - shopping (comparing prices, understanding weights and measures, value for money);  
  - travel and leisure (relating distances to travel time; comparing currencies and prices) |  
- Readiness to overcome the ‘fear of numbers’.  
- Willingness to use numerical computation in order to solve problems in the course of day-to-day work and domestic life. |
Numeracy is a math-containing everyday competence that everyone, in principle, needs in any given society at any given time. (Lindenskov & Wedege, 2001)

“To be numerate means to be competent and comfortable with one”s judgements on whether to use mathematics in a particular situation and if so, what mathematics to use, how to do it, what degree of accuracy is appropriate, and what the answer means in relation to the context.” (Coben, 2000 p.10)

Numeracy is a dynamic concept that can be defined as the individual“s competence to manage mathematical situations in everyday life, at work and in societal life and to accommodate flexibly to new demands in a continuously changing society (Van Groenestijn, 2002)
Learning and teaching in adult education
Previous research contributions

- Numerate behavior (Gal, van Groenestijn, Manly, Schmitt & Tout, 1999)
- Complexity factors
- Aligned with ISCED levels of education for comparability
http://dx.doi.org/10.1787/220337421165

OECD Education Working Papers No. 35

PIAAC Numeracy: A Conceptual Framework

PIAAC Numeracy Expert Group

Review of the PIAAC Numeracy Assessment Framework:
Final Report

Dave Tout, Diana Coben, Vince Geiger, Lynda Ginsburg, Kees Hoogland, Terry Maguire, Sue Thomson, & Ross Turner

January 2017
Numeracy is the ability to access, use, interpret, and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life.

Numerate Behavior involves managing a situation or solving a problem in a real context, by responding to mathematical content/information/ideas represented in multiple ways.
Numerate behavior involves managing a situation or solving a problem in a real context (everyday life, work, societal, further learning) by responding (identifying, interpreting, acting upon, communicating about) to mathematical information (quantity & number, dimension & shape, pattern & relationships, data & chance, change) that is represented in a range of ways (objects & pictures, numbers & symbols, diagrams & maps, graphs, tables, texts, formulae) and requires the activation of a range of enabling processes and behaviors (mathematical knowledge and understanding, mathematical problem solving skills, literacy skills, beliefs and attitudes). (Gal et al, 1999)
Coverage: Facets of Numerate behavior...

Involves managing a situation or solving a problem...

1. in a real context...
   everyday life, work, societal, further learning

2. by responding...
   10% - identify, locate or access
   40% - act upon, use: order, count, estimate, compute,
   30% - interpret, evaluate measure, model
   20% - communicate

3. to mathematical content/ information/ ideas...
   30% - quantity & number
   20% - dimension & shape
   30% - patterns, relationships, change
   20% - data & chance

4. represented in multiple ways:
   - objects & pictures
   - numbers & mathematical symbols, formulae
   - diagrams & maps, graphs, tables
   - texts
   - technology-based displays
Discussion points for a Common European Numeracy Framework

- How central is the problem solving / modeling cycle?
- Processes, domains, contexts, representations:
  - Which could act as main category?
  - Which as second category to create a matrix?
- Which 21st century (or higher order skills are the most fundamental for numeracy to be worked out?)
21st century skills

- Critical thinking
- Creative thinking
- Problem solving
- Self regulation
- Cooperation
- Communication
- Social and cultural skills
- ICT skills
- Information skills
- Media literacy
Thank you for your attention and input!

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