Adults and Mathematics - a vital subject

Lars Gustafsson

Presentation

The Swedish Adult Education System

Adults and Mathematics - a vital subject

the EMMA-project

Presentation

Folk high school teacher

Developmental work

A Mathematics for Liberal Adult Education

(Experience - Ideology - Research)

Commissions/experiences

ALM, ALL (IALS), FVU, Australia, …

National Center for Mathematics Education (NCM)

Investigatory work/reports (A&M, RPL), articles, conferences, teacher training (university courses), …

Urgent need: an anthology *Adults Learning Mathematics*.

The Swedish Adult Education System

Formal Education

The Swedish Adult Education System

Roots in "folkbildning"/liberal adult education.

Non-formal education

(Grundtvig)

Liberal Adult Education

Folk high schools (148)

Study organizations (8)

"free and voluntary"

personal fulfilment, democracy, citizenship, empowerment, "bildning"/"folkbildning"

Kapsalis (2001), Tuijnman & Hellström (2001).

http://skolnet.skolverket.se/polopoly/utbsys-eng/

http://www.folkbildning.se/page/59/translationsoversattningar.htm

http://www.folkbildning.se/download/608/x/facts_2007.pdf

http://www.folkbildning.se/download/498/x/FRAMSYN-eng.pdf

Goals for adult learning (formal education)

Government Bill 2000/01:72

(A result from an analysis of LLL and experiences from AEI.)

"All adults must be given the opportunity to broaden and deepen their knowledge and skills in order to promote personal development, democracy, equality of opportunity, economic growth and employment, and an equitable distribution of wealth."

This Goal is followed by a strategy for forming adult education – an ***infrastructure*** for adult learning.

The Adult Education Initiative

1997-2002

Background:

- AEI part of the Government´s strategy to halve unemployment by the year 2000.

Target groups:

- Adults who are unemployed and who either completely or partially lack 3 year upper secondary school competence.

Aims:

- Renewal of labour market policy.
- Reforming adult education.
- Promote economic growth.
- Reduce educational divisions.
- Putting the individual in the centre.

Some figures:

- 1,2 millions of persons.
- 42 billion SEK.
- (Additional programmes: ≈ 2 billion SEK.)

Adults and Mathematics – a vital subject

NCM Report 2002:3

The assignment

Background rationales

School, life and learning

Why mathematics?

School mathematics – an ideological construction?

Mathematical proficiency for everyone

Learning blockages and resistance

Mathematics in the national system of governance of adult education

Five areas of critical importance

The assignment

Government decision to commission NCM to carry out a survey and produce an analysis of measures required to improve mathematics learning among adults.

Adults and Mathematics - a vital subject

(NCM Report 2002:3)

Background rationales

Individual and society

Democracy and fundamental values

Lifelong and lifewide learning

Learning and knowledge in “the knowledge society”

Guidance and validation

ICT and adult learning

Providers in adult education – variety and quality

Some critical perspectives

Mathematics - a vital subject

“Numeracy” tradition

—

The Key Competencies in a Knowledge-based economy

European Commission. (2002). The Key Competencies in a Knowledge-based economy: A First Step Towards Selection, Definition and Desciption. A Proposal by the Working Group on Key Competencies, Set up by the European Commission in the Framework of the "Objectives Report".

Knowledge:
- addition and subtraction
- multiplication and division
- percentages and ratios

Skills:
- managing household budget
- shopping
- travelling
- work in one´s house

Attitudes:
- overcoming “fear of numbers”
- willingness to use numerical computation

Numeracy

Numeracy is the use of addition and subtraction, multiplication and division, percentages and ratios, through mental and written computation to solve problems, in autonomous, confident and efficient manner, in a multitude of everyday circumstances.

Math competence

Math competence thus involves the use of mathematical modes of thought (formulas, models, constructs, graphs/charts) which have a universal application in explaining, and describing reality.

Mathematical proficiency for everyone

- three aspects

Knowledge of the content of the subject

Strands & big ideas (LM)

Numbers/operations, geometry/visualisation, representations of relationsships/familarity with symbols, measurements/units, statistics/probability.

Change, chance, …

Competence in the subject

Productive approach, judgments, understanding concepts, mastering procedures, communicating, solving problems, presenting arguments, usings aids.

Life project

LLL/LWL, democracy/citizenship, empowerment, personal fulfilment, 'bildung' - a humanistic approach.

Importance of the subject as a cultural and societal phenomenon.

Learning – non-learning

Learning blockages and resistance

Affective aspects

(Grouws, Buxton, Evans, …)

Beliefs, attitudes, emotions

(Grouws)

Fear, anxiety

(Buxton, Tobias, Zaslavsky)

Defence – Resistance

(Illeris, Mellin-Olsen, Wedege & Evans)

Lack of motivation?

Life and identity projects?

"Blaming the victim"?

Paldanius (2002): The Rationality of Reluctance and Indifference; Ahl (2004).

Conflicting rationalities (Paldanius).

Five areas of critical importance

Five areas of critical importance

Affective factors and adults´ mathematical learning

Five areas of critical importance

Affective factors and adults´ mathematical learning

Adults´ informal mathematics learning

Five areas of critical importance

Affective factors and adults´ mathematical learning

Adults´ informal mathematics learning

Validation of adults´ mathematical proficiency

Five areas of critical importance

Affective factors and adults´ mathematical learning

Adults´ informal mathematics learning

Validation of adults´ mathematical proficiency

Mathematics as a subject for Bildung/liberal education

Five areas of critical importance

Affective factors and adults´ mathematical learning

Adults´ informal mathematics learning

Validation of adults´ mathematical proficiency

Mathematics as a subject for Bildung/liberal education

Syllabus development in mathematics

Reactions

MIMER

ALM-11 (2004)
(the 11th International Conference on Adult Learning Mathematics)

Baxter, M., Leddy, E., Richards, L., Tomlin, A., Wresniwiro, T., & Coben, D. (2006). *Measurement wasn't taught when they built the pyramids - was it?* The National Research and Development Centre for Adult Literacy and Numeracy (NRDC).

Ginsburg, L., Manly, M., & Schmitt, M. J. (2006). *The Components of Numeracy*. Cambridge, MA: National Center for the Study of Adult Learning and Literacy.

The EMMA project

The European Network for Motivational Mathematics for Adults

AIM

The purpose of this project is to create a sustainable and ever increasing network of experts in research, need analysis, didactic approach development, motivational aspects, and content creation related to the learning processes involved in adults learning Mathematics.

MEANS

Maintaining the EMMA portal

The project will create and sustain the EMMA-portal, which will be the network's main arena of discussion, the project's main means of dissemination and a tool for knowledge dissemination for all European experts and educators involved in this field.

EMMA-portal

Study Visits

Oslo, London, Bucharest, Copenhagen, Florence

EMMA
Participating countries

Norway (x2)
Spain
Netherlands
Denmark
Ireland
Sweden
Latvia
Austria
Greece
Italy
Romania
France
Belgium
Slovenia
Germany
Hungary
UK


27%
20 kr
Michael
Hans Jørgen
Finn

EMMA - some personal reflections

Administration!

Who are the participants? Why are we here?

The content?

What is the purpose?

<u>EMMA portal</u>

<u>Study visits/conferences</u>

To what benefit? - What are the outcomes?

Conclusion

Awareness rasing takes a lot of time!

EMMA-2?

END!

School, life and learning (1)

Learning must be perceived as meaningful

(understandable, relevant, useful (authentic))

Lindenskov (2001)

(Discussing adults perceptions/experiences of meaninglessness of mathematics.)

The invisibility of mathematics i everyday and working life

The artificial everyday mathematics in school mathematics (pseudorelevance)

Lack of understanding and knowledge of internal mathematical connections/structures

Frame factors (time), importance of teachers and social interaction, learners experiences as starting points not enough, life projects and “bildung”, …

School, life and learning (2)

Learning in formal, non-formal och informal environments

Mathematics for adults in the knowledge society

Who is the adult learner?

(heterogeneity, incentives for learning/participation (individual/societal), recruitment and dropout, Benn 1997, voluntariness and …)

What do we know about adults learning of mathematics?

Is there a specific "pedagogy for adults"?
Research in Sweden
International research (ALM)
International comparative studies (IALS, ALL)

What do we need to know more about/knowledge gaps?