



European
Basic Skills
Network

Policy Brief

Make it count:

Changing the way we think about numeracy

May 2014

Overview

Europe needs numerate citizens who are able to maximize their life chances and make a positive contribution to society. We need numerate populations in order to build strong economies and to be able to compete globally, as well as to improve social equality and civic trust. New research shows that we are currently failing to achieve this.

What needs to be done?

In order to improve adult numeracy, we need to change the way we think about numeracy. Numeracy should not be seen narrowly as an academic subject taught in school, but as the active and critical use of mathematics in everyday tasks, including in workplaces. The European Basic Skills Network, EBSN, recommends that policy makers in Europe prioritise numeracy development and adopt an approach to the teaching and learning of numeracy that emphasises how adults use it in everyday life.

Research

- The OECD PIAAC Adult Skills Survey (2013)ⁱ found 24% of the EU population at or below level 1 in numeracy on the five point scale. The European Commission recognised that “The Survey exposes serious skills gaps in Europe’s labour force. This skills gap not only contributes to high unemployment now, putting the least-skilled in a kind of “low-skills trap”, ... it also poses a threat to future growth and competitiveness.”
- Some EU countries (Fi, Cz, Ni, Be, Sk, Dk, At, Ee) have significantly better adult numeracy scores than others (UK, Ie, Fr, Es, It). However, the EU average numeracy scores compare poorly to Japan, Korea and Australia.
- The OECD research is of working age populations and shows proficiency declines with age. Data at national level (e.g. France)ⁱⁱ confirms numeracy skill levels among over 65’s are even weaker than other age cohorts.
- There are both social equity and economic arguments for supporting people with basic numeracy needs. Numeracy is even more closely associated with disadvantage than literacy, and has significant correlations with productivity and competitiveness (UK NRDC 2005 & 2010, Bynner and Parsons 2006)ⁱⁱⁱ.
- The relationships between low numeracy and outcomes for individuals are equally true for national economies. “Per capita incomes are higher in countries with larger proportions of adults who reach the highest levels of literacy or numeracy proficiency and with smaller proportions of adults at the lowest levels of proficiency” (OECD, 2013)^{iv}.
- Numeracy courses tend to be less expensive than ESOL or literacy courses (UK NRDC, 2010)^v.
- The result of the NIACE inquiry on adult numeracy learning (2011)^{vi} recommends a radical reshaping of priorities. Relatively poor numeracy can no longer be seen as a “badge of honour”. To raise numeracy skills among Europe’s adults, a cultural shift in public attitudes, and a change in its teaching, is required.

- While numeracy teaching generally becomes meaningful to students when it is related to their own purposes and needs, the main motivations of adults to participate in numeracy classes include to help their children and for understanding, engagement and enjoyment (UK NRDC, 2005)^{vii}. This indicates that a broad range of courses should be available to attract more adults and to keep them engaged in their learning.
- There is compelling evidence^{viii} from the UK, Ireland and Australia that programmes are more effective when literacy and numeracy are embedded or integrated with the subject specific content, leading to:
 - higher retention rates,
 - increased skills development in the vocational area and in literacy and numeracy, and
 - increased achievement of qualification outcomes – in the core subject or vocational area and in language, literacy and numeracy.

Practice

- Provision in Ireland and Scotland is recognised for the flexibility it encourages around adult learners' curriculums. Funding in both countries is to address the needs or goals of the individual, and is not tied to qualifications. This flexibility has encouraged much creative and innovative practice. The Adults Learning Mathematics international research forum references the CraftWorks and BEADazzled projects in Scotland^{ix}. In Ireland, the initiative <http://www.haveyogotmathseyes.com> supports numeracy awareness and practice, while NALA published a set of case studies in 2013^x to inform practices.
- In Denmark, numeracy provision is guided by the understanding that *Numeracy changes in time and space along with social change and technological development*^{xi}. There is a national curriculum in adult basic numeracy with national assessment, as well as a national teaching guide and training supports^{xii}. However, the content of courses are finalised by the teachers and students themselves. Participation in numeracy and literacy has increased steadily since the Act on Preparatory Adult Education was introduced in 2001^{xiii}.
- England developed an adult numeracy core curriculum^{xiv} and set required teacher qualifications, and family learning programmes are covered by the inspectorates for education and training in Wales and England.
- The recently launched (12/12/13) NIACE app '*Maths everywhere*' demonstrates how new technology can make numeracy learning accessible, everyday and fun. See <http://www.mathseverywhere.org.uk/>

Results

- **OECD** - Raising adult literacy and numeracy levels directly impacts on gross domestic product, while the greatest impact can be gained by investing at the lower levels (Coulombe et al, 2004)^{xv}.
- **Korea** - The Adult Skills Survey shows that Korea is among the three lowest-performing countries when comparing the skills proficiency of 55-65 year-olds, yet Korea ranks second only to Japan for proficiency among 16-24 year-olds, indicating that substantial progress is achievable.
- **UK** - The Skills for Life strategy is an example of a large scale and effective response to basic skills development among adult populations. Evaluations of Skills for Life (2009)^{xvi} identified increased participation and qualification levels, significant buy-in from employers, as well as positive impacts on individuals. Evaluation of the Scottish Adult Literacy and Numeracy strategy (2006)^{xvii} also

found strong benefits at both national and individual levels, particularly on health and well being.

- **Denmark** - Numeracy skills are relatively better than literacy skills for all age-groups (OECD 2013)^{xxviii}.
- **Finland** - In Finland, the Noste programme ran from 2003-2009. Among its aims were to prevent a projected skills shortage, to raise the employment rate, to enhance equality in society, and it focused on the most disadvantaged groups. Approximately 26,000 learners undertook studies through Noste^{xxix}, with just under 20,000 achieving qualifications, and approximately 12,000 of that group achieving full qualifications. It had a significant impact on participation among low skilled employees. Noste was one of 16 top ranked activities by the EU for raising awareness of adult learning (2012)^{xxx}.
- **Ireland** - The NALA Distance Learning Service^{xxxi} provides web-based self directed learning programmes, including a system for the recognition of prior learning (RPL). These programmes, delivered online through www.writeon.ie, include a range of 9 numeracy awards at EQF levels 1 and 2. This system is recognised as being “an effective RPL mechanism” (2011)^{xxii}, and the service was another of the 16 top ranked activities by the EU for raising awareness of adult learning (2012)^{xxiii}. The distance and blended learning approach is being promoted by national policy makers to support provision and practice^{xxiv} as a learning solution that offers particular promise for basic skills development, including numeracy.

Reflection

Successive OECD international literacy and numeracy surveys (IALS, ALLS, PIAAC and PISA surveys) identify the considerable scale of the challenge of raising adult numeracy levels at national and EU levels. However, EU and most national responses have been relatively weak. For the development of numerate behaviour, EBSN argue that it is not sufficient to focus only on what mathematical knowledge and skills are necessary and should be taught in a numeracy programme. The emphasis should also be on the way in which they are learned, and on the way teaching influences how they are learned. Developing numerate behaviour is a matter of acquiring and constructing knowledge and skills by solving real problems and meeting learner needs in authentic, meaningful situations, as well as learning how to reflect on new insights.

The Adult Skills Survey results show that people’s skills are influenced by how they are practised, reflecting better scores when skills are used in work and day to day living or participation in adult learning and training. This gives policy makers a key to unlocking the low skills trap. The way forward is to engage more people in better quality adult learning more often, particularly those with numeracy difficulties, and to involve employers and social partners in the strategic response to skills development. Enhancing initial training and continuing professional development for teachers and tutors will be needed to reflect this more nuanced approach, including for embedding numeracy in vocational training. Defining qualifications for adult numeracy teachers and trainers may also be required.

The OECD Skills Outlook 2013^{xxv} recommended a number of actions to policy makers, including that the most disadvantaged adults not only need to be offered, but also encouraged, to improve their proficiency, through learning opportunities tailored to their needs.

To be numerate means to be competent, confident, 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^{xxvi}.

Recommendations

- **Policy makers should adopt a broader definition of numeracy (e.g. as above) in order to support the kinds of numerate behaviour that contribute to a stronger and more equitable society and economy.**
- **Shift our approach to the teaching and learning of numeracy to support adults to learn for a variety of purposes (including enjoyment) and to use numeracy in everyday life.**
In line with the findings of the NIACE inquiry on adult numeracy learning, EBSN recommend that policy makers adopt a new approach to adult numeracy which “focuses on how adults use it in everyday life and that is how it should be taught^{xxviii}.”
 - **Provide a wide range of high quality numeracy learning opportunities for people to engage in numeracy learning for their different purposes.**
 - **Enhance initial and continuous training for teachers and tutors who support numeracy development, including embedding numeracy in further education and vocational training.**
- **Raise the profile of numeracy and enhance the value placed on numeracy skills.**
The development of adult numeracy, underpinned by a high-profile, media-led campaign, should be central to economic and social policy. With the support of media, especially public broadcasting service, EBSN urge each nation’s policy makers to bring a new appreciation of the value of numeracy.
- **Invest in research to ensure we know what works best for adult numeracy learning and achievement in different contexts, and to inform teacher training and continuing professional development.**
EBSN recommend that the policy makers and appropriate partners should continue to research and evaluate adult numeracy provision to chart the progress on what works best for adults.

How to use this brief: *To promote numeracy development in their countries, EBSN members may wish to translate or adapt this brief to their own contexts and culture. The EBSN asks you to inform us of any impact you achieve at secretariat@basicskills.eu.*

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References

I <http://www.oecd.org/site/piaac/surveyofadultskills.htm>

See also EU response "The Survey of Adult Skills (PIAAC): Implications for education and training policies in Europe"

II *The Information and Everyday Life Survey (IVQ, France 2004 & 2011)*.

III NRDC (2005) *Three years on: what the research is saying*. NRDC (2010) *Adult numeracy A review of research*, Bynner, J., & Parsons, S. (2006) *New Light on Literacy & Numeracy* http://nrdc.org.uk/publications_details.asp?ID=78

IV http://skills.oecd.org/documents/SkillsOutlook_2013_KeyFindings.pdf, page 6

V NRDC (2010) *Adult numeracy A review of research*

VI *Numeracy Counts Final Report* on the NIACE Committee Inquiry on Adult Numeracy Learning, NIACE February 2011 http://shop.niace.org.uk/media/catalog/product/n/u/numeracy_counts_final_report_feb_2011a.pdf

VII The NRDC report: *Beyond the daily application': making numeracy teaching meaningful to adult learners* London: NRDC 2005 http://www.nrdc.org.uk/uploads/documents/doc_2977.pdf

VIII Casey, H., et al, (2006) "You wouldn't expect a maths teacher to teach plastering...": *Embedding literacy, language and numeracy in post-16 vocational programmes – the impact on learning and achievement*. London: NRDC

See also: NALA (2011), *A Literature Review of International Adult Literacy Policies* Dublin: NALA.

Hegarty, A., & Feeley, M., (2009), *Literacy-friendly further education and training*. Dublin: NALA

Commonwealth of Australia, (2000) *Built in not bolted on: Language, literacy numeracy issues in the delivery of training packages*, www.anta.gov.au.

IX See <http://www.alm-online.net/international-view/scotland/>

X http://www.nala.ie/sites/default/files/publications/numeracy_report_0.pdf

XI Lindenskov, L & Wedege, T 2001, 'Numeracy as an analytical tool in adult education and research'. Centre for Research in Learning Mathematics, Publication no.31, pp. 1-37, Roskilde University.

XII Wedege, T. (2010). Adults learning mathematics: Research and education in Denmark. In Sriraman, B. et al. (eds.), *The sourcebook on Nordic research in mathematics education: Norway, Sweden, Iceland, Denmark and contributions from Finland* (pp. 627-650). Charlotte, NC: Information Age Publishing.

XIII *Bekendtgørelse af lov om forberedende voksenundervisning (FVU-loven)*. [Order on Act on Preparatory Adult Education]. LBK nr 16 af 07/01/2005. <https://www.retsinformation.dk/Forms/R0710.aspx?id=24627>

XIV <http://www.excellencegateway.org.uk/node/1514>

XV Coulombe, S., J.F. Tremblay and S. Marchand, *International Adult Literacy Survey, Literacy Scores, Human Capital and Growth across Fourteen OECD Countries*, Statistics Canada, Ottawa, 2004.

XVI Metcalf H, Meadows P, Rolfe H and Dhudwar A (2009) *Evaluation of the impact of Skills for Life Learning: Longitudinal survey of adult learners on college-based literacy and numeracy courses, final report* London: Department for Business, Innovation and Skills

XVII Tett, L., S. Hall, et al. (2006). *Evaluation of the Scottish adult literacy and numeracy (ALN) strategy: final report*. Scottish Executive.

XVIII Rosdahl, A. ; Fridberg, T.; Jakobsen, V.; Jørgensen, M. (2013) *Færdigheder i læsning, regning og problemløsning med it i danmark*. SFI – Det nationale forskningscenter for velfærd, pp. 1-419. [PIACC – Danish report]

XIX Ministry of Education and Culture, Finland (2010) *Noste Programme 2003-2009. Final Report*. Helsinki: Ministry of Education and Culture.

XX 'European Guide – Strategies for improving participation in and awareness of adult learning'. EU 2012 <http://bookshop.europa.eu/en/strategies-for-improving-participation-in-and-awareness-of-adult-learning-pbNC3112514/>

XXI Annual evaluations available on <http://www.nala.ie/resources/136>

XXII *Developing Recognition of Prior Learning (RPL)*, Forfas: 2011, Dublin Ireland

XXIII See xv above 'European Guide – Strategies for improving participation in and awareness of adult learning'.

XXIV <http://www.education.ie/en/Publications/Policy-Reports/Review-of-ALCES-funded-Adult-Literacy-Provision.pdf>

XXV http://skills.oecd.org/documents/SkillsOutlook_2013_KeyFindings.pdf

XXVI Coben, D., 2000, Numeracy, mathematics and adult learning. *Adult Numeracy Development: Theory, research, practice*. Cresskill, NJ: Hampton Press

XXVII http://shop.niace.org.uk/media/catalog/product/n/u/numeracy_counts_final_report_feb_2011a.pdf