



**HAL**  
open science

## Initiating a Common European Numeracy Framework

Kees Hoogland, Marlies Auer, Javier Díez-Palomar, Niamh O'Meara, Mieke van Groenestijn

► **To cite this version:**

Kees Hoogland, Marlies Auer, Javier Díez-Palomar, Niamh O'Meara, Mieke van Groenestijn. Initiating a Common European Numeracy Framework. Eleventh Congress of the European Society for Research in Mathematics Education, Utrecht University, Feb 2019, Utrecht, Netherlands. hal-02409293

**HAL Id: hal-02409293**

**<https://hal.science/hal-02409293v1>**

Submitted on 13 Dec 2019

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Initiating a Common European Numeracy Framework

Kees Hoogland<sup>1</sup>, Marlies Auer<sup>2</sup>, Javier Díez-Palomar<sup>3</sup>, Niamh O'Meara<sup>4</sup> and Mieke van Groenestijn<sup>5</sup>

<sup>1</sup>HU University of Applied Sciences Utrecht, The Netherlands; [kees.hoogland@hu.nl](mailto:kees.hoogland@hu.nl)

<sup>2</sup>BFI Oberösterreich, Linz, Austria; [marlies.auer@bfi-ooe.at](mailto:marlies.auer@bfi-ooe.at)

<sup>3</sup>University of Barcelona, Spain; [jdiezpalomar@ub.edu](mailto:jdiezpalomar@ub.edu)

<sup>4</sup>University of Limerick, Ireland; [niamh.omeara@ul.ie](mailto:niamh.omeara@ul.ie)

<sup>5</sup>HU University of Applied Sciences Utrecht, The Netherlands; [mieke.vangroenestijn@kpnmail.nl](mailto:mieke.vangroenestijn@kpnmail.nl)

*This paper is a discussion paper to support an Erasmus+ project with the name Common European Numeracy Framework (CENF) (for adults) which will start at the end of the year 2018. In the first months of 2019 the team with participants from The Netherlands, Austria, Spain and Ireland will be in the process of collecting European examples of numeracy practices and current numeracy frameworks. At the conference we will show the results of this collection to date and the initial outline of a tentative CENF. We intend to spark comments, suggestions and insights from the participants of TWG07 - Adults Mathematics Education - to enrich the collection and as feedback on the initial outline of the CENF. Another aim is to create a network of national or regional stakeholders which will support the development of a shared framework for numeracy goals and numeracy education for adults in the 21<sup>st</sup> century.*

*Keywords: Numeracy framework, professional development, pilot courses, Erasmus+.*

## Introduction

In 2017 four educational institutes from The Netherlands, Austria, Spain, and Ireland respectively, took the initiative to develop a numeracy framework for adults. A grant was awarded by the European Union in an Erasmus+ project to work towards such a framework in the years 2019-2021.

As result of this project a tentative Common European Numeracy Framework (CENF) will be established and based on this framework a set of professional development modules (PDM) for adult numeracy educators will be developed. The CENF will incorporate the latest insights into numeracy skills and competencies which are relevant for our technologised and numbers-drenched society.

The suite of professional development modules developed for teachers and volunteers who teach on numeracy courses will be based on the CENF. The PDMs will foster the capability of teachers and volunteers to effectively develop basic skills and competences among adult learners in order to strengthen their employment prospects, develop their socio-educational and personal skills, and counteract social exclusion. It will also equip adult learners with the skills highly needed to participate in civic and social life.

In short, the objective of this project is to first develop a Common European Numeracy Framework and secondly to expand and to improve the number and the quality of numeracy courses (or other relevant educational activities) offered to adults to improve their life chances of prospering in

society. To reach this objective, we will use on a multi-level approach for addressing teachers and volunteers that are involved in the delivery of numeracy courses, the teacher educators who deliver courses to those teachers and volunteers, and policy makers and other stakeholders who are responsible for creating opportunities for such courses. This multi-level approach already has started by connecting the associated partners to our goals in this application.

The CENF will comprise of information on the effective teaching and learning of numeracy, especially in relation to adults who have left school early and those from disadvantaged backgrounds. Such a framework can also be used as a mechanism for systemically tracking and monitoring the progress of adult learners in the field of numeracy. The professional development modules will be made available on-line in an attempt to actively contribute to extending and developing educators' competences and maximize the chance of European wide use of the project outputs.

## **Background**

Too many European citizens lack the necessary numeracy competencies to participate autonomously and effectively in our technologized and number-drenched society. Consequently many citizens are overlooked for certain jobs and have problems in their daily life, dealing with the abundance of number-related issues. In literature, these competencies are referred to as '21<sup>st</sup> century skills' or '21<sup>st</sup> century competences (Voogt & Pareja Roblin, 2012), global competences (OECD, 2016a) or skills for "the 4th industrial revolution" (Schwab, 2016).

The results of the last PIAAC survey (OECD, 2013, 2016b; PIAAC Numeracy Expert Group, 2009) show that a quarter of the participating countries in PIAAC have results below level 2 of the 6-point scale. Scores below level 2 are associated with having problems in daily activities due to low numeracy skills. These results on numeracy give rise to serious cause for concern for the future economic development of Europe. This is an even more pressing issue since the amount of numerical data that needs to be interpreted and used is rapidly rising due to technological developments and the prevalence of (big) data. To gain a better insight in these trends a second cycle of PIAAC will be starting in 2020 (Hoogland, Diez-Palomar, & Maguire, 2019; Kirsch & Lennon, 2017; Tout et al., 2017).

On average, school leavers between the age of 16 and 24, perform at a lower level than people between the ages of 25 and 44 (OECD, 2016b). The lack of numeracy skills among these people increases the risk of unemployment and may influence family life and social inclusion. In particular, low-skilled workers are at risk in the labour market, particularly when faced with adaptations in the labour market. The Council of the European Union emphasizes that adult learning is a means for upskilling or reskilling those affected by unemployment, restructuring and career transition, while simultaneously it makes an important contribution towards social inclusion, active citizenship and personal development. The European Council recommends the enhancement of basic skills including literacy, numeracy, problem solving and digital skills as part of the Europe 2020 Strategy (European Commission, 2017).

In the frame of lifelong learning, therefore, adult numeracy education has an important role in the development of good programs for basic skills for the future.

Evidence-informed adult numeracy education may be the key for attaining the goals set out in the Europe 2020 strategy. In most European countries, adult numeracy education is a locally based endeavour with a plethora of practices, some efficient, some less so. Furthermore, there is a variety of underlying assumptions on what constitutes good adult numeracy education. The availability of a good collection of (piloted) professional development modules, based on the CENF (which contains relevant content and insights for adults learning numeracy and mathematics), will generate a quality adult numeracy education across Europe, and thereby contribute to policies and activities which address the low-numeracy levels in many European countries. Effective numeracy education in European countries, based on a common framework, may lead to a higher level of societal participation and inclusion of adults, and thereby to the improvement of the European economy.

### **Project methodology as starting point for workgroup discussion**

In this section we present the methodology which will be used in the Erasmus+ project (Hoogland, Diez-Palomar, & Vliegthart, 2019). In the working group of CERME11 we will use these headings as a guide for the discussion. The aim of this discussion paper is to inform the participants of TWG07 and to tap into their knowledge, experiences, and networks to strengthen the impact of the project.

The project methodology can be laid out as follows.

#### **The context**

The number of European citizens lacking the necessary numeracy competences to participate autonomously and effectively in our technologised and number-drenched society is a serious concern for the economic development of Europe. (OECD, 2012, 2013, 2016b; PIAAC Numeracy Expert Group, 2009). The European Council recommends enhancement of the basic skills - literacy, numeracy, problem solving and digital skills - as part of the Europe 2020 Strategy (European Commission, 2017).

Evidence informed adult numeracy education is the key for reaching the goals as mentioned in the Europe 2020 strategy. In most European countries adult numeracy education is a locally based endeavour with a plethora of practices, some efficient, some less so and with a great variety of underlying assumptions on what constitutes good adult numeracy education. A good set of (tried-out) professional development modules based on a common European numeracy framework (which contains relevant content and insights in adults learning numeracy and mathematics) will generate a qualitative and quantitative impulse in adult numeracy education across Europe, and thereby contribute to policies and activities which address the low-numeracy levels in many European countries.

#### **The objectives**

The ultimate objective of the project is to enlarge the number and to improve the quality of numeracy courses (or other relevant educational settings) offered to adults to improve their chances in society. To reach this objective we develop a Common European Numeracy Framework (CENF) and set of professional development modules (PDMs)

## **The target group and the participants in the project.**

The ultimate target group of the project are the participants in adult numeracy courses. The aim is to provide them with numeracy competences which will benefit them in participating adequately in daily life and work-related situations in our number-drenched society. Numeracy to this regard is considered to be a social practice (Yasukawa, Rogers, Jackson, & Street, 2018). However, the availability and quality of adult numeracy courses around Europe are dependent on many factors, of which many are outside the scope and influence of this project. Therefore, we choose a multi-level approach of addressing teachers and volunteers who are actually involved in the numeracy courses, the teacher educators who provide courses to those teachers and volunteers, and policy makers and other stakeholders who are responsible to create opportunities for such courses (both by teachers and by teacher educators). In doing so, the project will involve the local, regional, national and international communities of practitioners, researchers, and policy makers around adult numeracy education by information, surveys, presentations, and presenting a CENF.

## **The activities**

On the basis of literature studies and broad European surveys on used frameworks, good practices, and theoretical insights we will develop a draft framework and draft modules. This will be followed by try-outs in the partner countries to test the drafts empirically and to collect feedback from various stakeholders from the adult numeracy community. The framework and modules will be revised with the gathered experiences, evaluations and comments. The end result will be made available as a blended on-line course, while the availability as cMooc will be investigated.

## **The methodology**

The ways of gathering the information are literature reviews, surveys and peer reviewed development of products, according to academic standards for research methodology.

The methodology for dissemination, implementation and sustainability is based on the multilevel approach of educational changes as for instance propagated by Hargreaves, Lieberman, Fullan, and Hopkins (2010) and Fullan (2008); Fullan, Hill, and Crévola (2006).

## **The result**

The result will be an increase in the quality and quantity of numeracy courses and professional development courses on adult numeracy education. The concrete results of the project are a CENF and a set of PDMs for teachers and volunteers who work in adult numeracy education. Both outputs we consider as essential in reaching the ultimate objective.

## **The impact**

The existing European networks on adult numeracy education support the project as associate partners and express their willingness to advocate the results through their network communications and in their network meetings. The CENF will have an impact across Europe.

## **Long term benefits**

A common approach and a reinforcement to create high quality national professional development courses based on a common framework can have a long-lasting effect on the development of high quality adult numeracy education around Europe.

## **Discussion**

The discussion points on the starting project followed the project methodology. Below, to each discussion point a short outcome of the discussion in the Thematic Working Group is mentioned

### **The context and the objectives**

Q: What should be added to the context to make the picture more complete or richer in examples?

A: Special attention is needed for participants who are vulnerable learners, often with negative educational experiences.

Q: Can a Common European Numeracy Framework be helpful in the further development of adult numeracy education?

A; Yes, as long as it is developed bottom-up and connects to existing practices and frameworks.

### **The target group and the participants in the project.**

Q: Should the framework aim at participants in adult numeracy courses, at practitioners in adult numeracy education in the European countries, at adult numeracy course designers, or at policy makers?

A: Both practitioners and policy makers must be able to read and understand the framework. For participants materials can be designed which are closely relate to the framework, for instance rubrics or descriptions of typical behaviour.

### **The activities, the methodology, the results of the project**

Q: Which other activities are paramount to reach the envisioned goals?

A: The project would strengthen as the participants' voices were heard in the developmental stages of the framework. The participants are adults who have an opinion on how learning goals could and would look like.

Q: Which activities should be added to make the results stronger and more widely-spread?

A: The design and the implementation of the framework would benefit by international parallel research and validation of parts of the framework

### **The impact and the long term benefits**

Q: Which actions might increase the chance to reach a really *common* European Numeracy Framework on adult numeracy education? Who are the most important stakeholders?

A: Both policy makers and networks of practitioners and researchers are important. Translating the framework in as many European languages as possible can help the acceptance and use.

The results of this discussion will be input for the further development of the Common European Numeracy Framework..

## **Acknowledgement**

This project is carried out in an European project Common European Numeracy Framework with the support of the Erasmus+ programme of the European Union.

## **References:**

- European Commission. (2017). *A renewed EU agenda for higher education SWD(2017)264*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017SC0164&from=en>
- Fullan, M. (2008). *The six secrets of change: What the best leaders do to help their organizations survive and thrive* (1st ed.). San Francisco, CA: John Wiley & Sons.
- Fullan, M., Hill, P., & Crévola, C. (2006). *Breakthrough*. Thousand Oaks, CA: Corwin Press.
- Hargreaves, A., Lieberman, A., Fullan, M., & Hopkins, D. (Eds.). (2010). *Second International handbook of educational change*. Dordrecht, The Netherlands: Springer.
- Hoogland, K., Díez-Palomar, J., & Vliegthart, M. (2019). Towards a common European numeracy framework. In: B. Kelly, D. Kaye, D. Griffiths, D. Dalby, & J. Stacey (Eds.), *Boundaries and Bridges: Adults learning mathematics in a fractured world. Proceedings of the 25th International Conference of Adults Learning Mathematics: A Research Forum (ALM)* (pp. 64–66). London, England: UCL Institute of Education.
- Hoogland, K., Díez-Palomar, J., & Maguire, T. (2019). Towards a second cycle of PIAAC. In: B. Kelly, D. Kaye, D. Griffiths, D. Dalby, & J. Stacey (Eds.), *Boundaries and Bridges: Adults learning mathematics in a fractured world. Proceedings of the 25th International Conference of Adults Learning Mathematics: A Research Forum (ALM)* (pp. 67–68). London, England: UCL Institute of Education.
- Kirsch, I., & Lennon, M. L. (2017). PIAAC: a new design for a new era. *Large-scale Assessments in Education*, 5(1), 11. doi:10.1186/s40536-017-0046-6
- OECD. (2012). *Literacy, numeracy and problem solving in technology-rich environments: Framework for the OECD Survey of Adult Skills*. Paris, France: OECD Publishing.
- OECD. (2013). *OECD Skills Outlook 2013: First results from the survey of adult skills*. Paris, France: OECD Publishing.
- OECD. (2016a). *Global competency for an inclusive world*. Paris, France: OECD Publishing.
- OECD. (2016b). *Technical report of the survey of adult skills (PIAAC)* (2nd Edition). Paris, France: OECD Publishing.
- PIAAC Numeracy Expert Group. (2009). *PIAAC Numeracy: A conceptual framework*. Retrieved from

[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP\(2009\)14&doclanguage=en](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2009)14&doclanguage=en)

Schwab, K. (2016). *The Fourth Industrial Revolution: what it means, how to respond*. Retrieved from <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

Tout, D., Coben, D., Geiger, V., Ginsburg, L., Hoogland, K., Maguire, T., . . . Turner, R. (2017). *Review of the PIAAC numeracy assessment framework: Final report*. Camberwell, Australia: Australian Council for Educational Research (ACER).

Voogt, J., & Pareja Roblin, N. N. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, 44(3), 299-321. doi:10.1080/00220272.2012.668938

Yasukawa, K., Rogers, A., Jackson, K., & Street, B. V. (Eds.). (2018). *Numeracy as social practice: global and local perspectives*. London, UK: Routledge. doi:10.4324/9781315269474