



This year we invite you to join us at the **28th Adults Learning Mathematics conference**:

ALM28 - Numeracy and Vulnerability

Monday, July 5th - Wednesday, July 7th 2021

The conference will be virtual and hosted by the University of Hamburg.

Main themes of the conference will be:

Vulnerability in Adult Life – and how it affects Numeracy Practices by Professor Anke Grotlüschen (University of Hamburg, GER)

Numeracy, vulnerability, ethics and social justice by Professor Gelsa Knijnik (Universidade do Vale do Rio dos Sinos, BRA)

The new literacies of automation: Justice in the digital era by Professor Suzanne Smythe (Simon Fraser University, Burnaby, CAN)

Financial numeracy and vulnerability by Professor José Julián Coa-Alvira (The City University of New York, USA)

Climate change in the mathematics and numeracy classroom - Discussion with Professor Chris Budd (University of Bath, Gresham College, UK) chaired by Beth Kelly (ALM chairperson, University College London, Institute of Education, UK)

Covid-19 and numeracy challenges by Professor Kevin McConway (Open University, UK)

A series of workshops and sessions will also be held at the conference on a range of topics. The schedule plus abstracts for these sessions will be available prior to the conference to help participants choose which to attend.

We are looking forward to seeing you at the conference. You can find more information on the **ALM28-website** (<https://alm-online.net/alm28-conference/>) which we will update regularly.

If you have further questions visit the ALM28-website (<https://alm-online.net/alm28-conference/>) or contact Lisanne Heilmann (alm-conference.ew@uni-hamburg.de).

Content

| | |
|--|----|
| <i>How can I participate?</i> | 3 |
| <i>Programme Overview (Times for Hamburg, Germany)</i> | 4 |
| <i>Programme Overview (Times for London, Great Britain)</i> | 5 |
| <i>Social events (with multiple time zones)</i> | 6 |
| <i>Programme (with multiple time zones)</i> | 7 |
| Monday, July 5 th | 7 |
| Tuesday, July 6 th | 9 |
| Wednesday, July 7 th | 12 |
| <i>Keynotes</i> | 14 |
| Keynote 1: Vulnerability in Adult Life – and how it affects Numeracy Practices | 14 |
| Keynote 2: Numeracy, vulnerability, ethics and social justice | 15 |
| Keynote 3: The new literacies of automation: Justice in the digital era | 15 |
| Keynote 4: Financial numeracy and vulnerability | 16 |
| Keynote 5: Climate change in the mathematics and numeracy classroom | 17 |
| Keynote 6: Covid-19 and numeracy challenges | 18 |
| <i>Short Abstracts (in order they appear in the programme)</i> | 19 |

How can I participate?

1. Do you want to **host a discussion group or social event**? If you want to host an open space, or if you would like to meet, talk to, discuss experiences with others on a specific field/question? Or do you have a hobby or skill you'd like to share (e.g. a yoga class, virtual joint cooking, virtually meet people for a (lunch break) walk)?

Let us know what you'd like to offer and send us an email to alm-conference.ew@uni-hamburg.de with your name, the theme, and preferred time slots.

2. If you've been to an ALM conference, you might value the **conference banquet** as an integral part of the ALM community. You (and your loved ones) are welcome to join us at this year's virtual **conference party** (dinner for some, breakfast for others) on Tuesday, July 5th, 9 pm (in Germany, MESZ).

As part of this year's conference party, you are invited to **read poems of hope or sing in your native/home language**. Alas, this year, only one person can sing at a time.

In addition, we invite you to send us a short video of yourself dancing the **Jerusalema dance**. (You can also include others in the dance for moral support.) Please send the video to the ALM secretary (secretary@alm-online.net) by the 21st June 2021 (Midsummer Day). It should be no longer than 4 Minutes. We will edit the videos together and show them at the party.

Examples of the dance as well as instructional videos can be found here:

<https://www.youtube.com/watch?v=6efHtpJK-Ns>

https://www.youtube.com/watch?v=r_I3uZdH7nQ

<https://www.youtube.com/watch?v=gGQ73MgqtvA>

Programme Overview (Times for Hamburg, Germany)

Monday, July 5th

11:00 - 11:30 am
Welcome speeches

11:30 - 12:00 am
How to participate at ALM28

12:30 - 2:00 pm
**Keynote 1:
Vulnerability in Adult Life - and how it affects Numeracy Practices**
Prof. Anke Grotlüschen (University of Hamburg, GER)

2:15 - 2:45 pm
For Presenters: Technical check

4:00 - 4:30 pm
Practicing Mindfulness

5:00 - 6:30 pm
**Keynote 2:
Numeracy, vulnerability, ethics and social justice**
Prof. Gelsa Knijnik (Universidade Vale do Rio dos Sinos, BRA)

7:00 - 8:30 pm
Parallel sessions/Workshops A

9:00 - 10:30 pm
**Keynote 3:
The new literacies of automation: Justice in the digital era**
Prof. Suzanne Smythe (Simon Frazer)

Tuesday, July 6th

9:00 - 10:30 am
Parallel sessions/Workshops B

11:00 am - 12:30 pm
Parallel sessions/Workshops C

1:00 - 1:30 pm
Virtual Sightseeing Tour Hamburg

3:30 - 5:00 pm
Parallel sessions/Workshops D

5:30 - 7:00 pm
**Keynote 4:
Financial numeracy and vulnerability**
Prof. José Julián Coa-Alvira (Lehman College of The City University of New York, USA)

7:15 - 8:30 pm
ALM Annual General Meeting

9:00 - 10:30 pm
Conference Party

Wednesday, July 7th

4:00 - 4:03 am/open end
parallel discussion groups for keynotes 1 & 2

10:00 - 11:30 am
**Keynote 5:
Climate Change in the mathematics and numeracy classroom**
Discussion with Prof. Chris Budd (University of Bath, Gresham College, UK) and a workshop chaired by Dr. Beth Kelly (ALM chairperson, University College Institute of Education, UK)

1:00 - 2:30 pm
Parallel sessions/Workshops E
12:30 - 1:00 pm/open end
parallel discussion groups for keynotes 3 & 4

4:00 - 5:30 pm
**Keynote 6:
Covid-19 and numeracy challenges**
Prof. Kevin McConway (Open University, UK)

5:30 - 6:00 pm
Closing words

Programme Overview (Times for London, Great Britain)

Monday, July 5th

10:00 - 10:30 am
Welcome speeches

10:30 - 11:00 am
How to participate at ALM28

11:30 am - 1:00 pm
**Keynote 1:
Vulnerability in Adult Life - and how it affects Numeracy Practices**
Prof. Anke Grotlüschen (University of Hamburg, GER)

1:15 - 1:45 pm
For Presenters: Technical check

3:00 - 3:30 pm
Practicing Mindfulness

4:00 - 5:30 pm
**Keynote 2:
Numeracy, vulnerability, ethics and social justice**
Prof. Gelsa Knijnik (Universidade Vale do Rio dos Sinos, BRA)

6:00 - 7:30 pm
Parallel sessions/Workshops A

8:00 - 9:30 pm
**Keynote 3:
The new literacies of automation: Justice in the digital era**
Prof. Suzanne Smythe (Simon Fraser University, CAN)

Tuesday, July 6th

8:00 - 9:30 am
Parallel sessions/Workshops B

10:00 - 11:30 am
Parallel sessions/Workshops C

12:00 - 12:30 pm
Virtual Sightseeing Tour Hamburg

2:30 - 4:00 pm
Parallel sessions/Workshops D

4:30 - 6:00 pm
**Keynote 4:
Financial numeracy and vulnerability**
Prof. José Julián Coa-Alvira (Lehman College of The City University of New York, USA)

6:15 - 7:30 pm
ALM Annual General Meeting

8:00 - 9:30 pm
Conference Party

Wednesday, July 7th

3:00 - 3:30 am/open end
parallel discussion groups for keynotes 1 & 2

9:00 - 10:30 am
**Keynote 5:
Climate Change in the mathematics and numeracy classroom**
Discussion with Prof. Chris Budd (University of Bath, Gresham College, UK) and a workshop chaired by Dr. Beth Kelly (ALM chairperson, University College Institute of Education, UK)

12:00 - 1:30 pm
Parallel sessions/Workshops E
11:30 am - 12:00 pm/open end
parallel discussion groups for keynotes 3 & 4

3:00 - 4:30 pm
**Keynote 6:
Covid-19 and numeracy challenges**
Prof. Kevin McConway (Open University, UK)

4:30 - 5:00 pm
Closing words

Social events (with multiple time zones)

Monday, July 5th

| | | |
|---------------------|----------------|---|
| Vancouver, CAN | 5:15 AM | Testing Zoom (open for all presenters) Offer open to all presenters to test screen sharing, microphone, lighting etc. By Charlotte Arkenback-Sundström <i>Dorothy Vaughan Room (Zoom Room #1)</i> |
| New York, USA | 8:15 AM | |
| Brasília, BRA | 9:15 AM | |
| London, UK | 1:15 PM | |
| Hamburg, GER | 2:15 PM | |
| Singapur, SGP | 8:15 PM | |
| Wellington, NZL | 12:15 AM (Tue) | |

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|---------------------|----------------|---|
| Vancouver, CAN | 7:00 AM | Practicing Mindfulness With Madeleine Lavin and Catherine Byrne <i>Jane Marcet Room (Zoom-Room #2)</i> |
| New York, USA | 10:00 AM | |
| Brasília, BRA | 11:00 AM | |
| London, UK | 3:00 PM | |
| Hamburg, GER | 4:00 PM | |
| Singapur, SGP | 10:00 PM | |
| Wellington, NZL | 02:00 AM (Tue) | |

Tuesday, July 6th

| | | |
|---------------------|-----------------|--|
| Vancouver, CAN | 4:00 AM | Virtual Sightseeing Tour through Hamburg Rachel Mayr <i>Jane Marcet Room (Zoom-Room #2)</i> |
| New York, USA | 7:00 AM | |
| Brasília, BRA | 8:00 AM | |
| London, UK | 12:00 PM | |
| Hamburg, GER | 1:00 PM | |
| Singapur, SGP | 7:00 PM | |
| Wellington, NZL | 11:00 PM | |

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|---------------------|----------------|--|
| Vancouver, CAN | 12:00 PM | Conference party Food, talk, dance and poems. <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| New York, USA | 3:00 PM | |
| Brasília, BRA | 4:00 PM | |
| London, UK | 8:00 PM | |
| Hamburg, GER | 9:00 PM | |
| Singapur, SGP | 3:00 AM (Wed) | |
| Wellington, NZL | 7:00 AM (Wed) | |

Programme (with multiple time zones)

Monday, July 5th

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|---------------------|-----------------|--|
| Vancouver, CAN | 2:00 AM | |
| New York, USA | 5:00 AM | |
| Brasília, BRA | 6:00 AM | |
| London, UK | 10:00 AM | Welcome speeches (30 Min) |
| Hamburg, GER | 11:00 AM | Beth Kelly (ALM chair, UK), Anke Grotlüschen (Hamburg Numeracy Project, GER) |
| | | <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| Singapur, SGP | 5:00 PM | |
| Wellington, NZL | 9:00 PM | |

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|---------------------|-----------------|---|
| Vancouver, CAN | 2:30 AM | |
| New York, USA | 5:30 AM | |
| Brasília, BRA | 6:30 AM | |
| London, UK | 10:30 AM | How to participate at ALM28 (30 Min) |
| Hamburg, GER | 11:30 AM | A short introduction into the platforms, structure and support systems by Dr. Lisanne Heilmann (University of Hamburg, GER) |
| | | <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| Singapur, SGP | 5:30 PM | |
| Wellington, NZL | 9:30 PM | |

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|---------------------|-----------------|------------------------------|
| Vancouver, CAN | 3:00 AM | |
| New York, USA | 6:00 AM | |
| Brasília, BRA | 7:00 AM | |
| London, UK | 11:00 AM | Short break (30 Min) |
| Hamburg, GER | 12:00 PM | e.g. testing the Wonder Room |
| | | <i>Wonder Room</i> |
| Singapur, SGP | 6:00 PM | |
| Wellington, NZL | 10:00 PM | |

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|---------------------|-----------------|---|
| Vancouver, CAN | 3:30 AM | |
| New York, USA | 6:30 AM | |
| Brasília, BRA | 7:30 AM | |
| London, UK | 11:30 AM | Keynote 1 (90 Min) |
| Hamburg, GER | 12:30 PM | Vulnerability in Adult Life – and how it affects Numeracy Practices by Prof. Anke Grotlüschen (University of Hamburg) |
| | | <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| Singapur, SGP | 6:30 PM | |
| Wellington, NZL | 10:30 PM | |

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| Vancouver, CAN | 5:00 AM | Long break (180 Min) e.g. joint cooking and/or dining in the Wonder Room <i>Wonder Room</i> |
| New York, USA | 8:00 AM | |
| Brasília, BRA | 9:00 AM | |
| London, UK | 1:00 PM | Social event: Testing Zoom (open for all presenters) Offer open to all presenters to test screen sharing, microphone, lighting etc. <i>Dorothy Vaughan Room (Zoom Room #1)</i> [for specific time and more information see page 7] |
| Hamburg, GER | 2:00 PM | |
| Singapur, SGP | 8:00 PM | Social event: Practicing Mindfulness With Madeleine Lavin and Catherine Byrne <i>Jane Marcet Room (Zoom-Room #2)</i> [for specific time and more information see page 7] |
| Wellington, NZL | 12:00 AM (Tue) | |

| | | |
|---------------------|----------------|---|
| Vancouver, CAN | 8:00 AM | Keynote 2 (90 Min): Numeracy, vulnerability, ethics and social justice by Prof. Gelsa Knijnik (Universidade do Vale do Rio dos Sinos, BRA) <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| New York, USA | 11:00 AM | |
| Brasília, BRA | 12:00 PM | |
| London, UK | 4:00 PM | |
| Hamburg, GER | 5:00 PM | |
| Singapur, SGP | 11:00 PM | |
| Wellington, NZL | 3:00 AM (Tue) | |

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|---------------------|----------------|---|
| Vancouver, CAN | 9:30 AM | Short break (30 Min) <i>Wonder Room</i> |
| New York, USA | 12:30 PM | |
| Brasília, BRA | 1:30 PM | |
| London, UK | 5:30 PM | |
| Hamburg, GER | 6:30 PM | |
| Singapur, SGP | 12:30 AM (Tue) | |
| Wellington, NZL | 4:30 AM (Tue) | |

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|---------------------|----------------|---|
| Vancouver, CAN | 10:00 AM | Parallel sessions / Workshops A (90 Min): <i>Dorothy Vaughan Room (Zoom Room #1)</i> |
| New York, USA | 1:00 PM | |
| Brasília, BRA | 2:00 PM | A1. Numeracy practices and vulnerability under conditions of limited financial means: "Without money, you can't survive or do anything or develop yourself". Wiebke Curdt (University of Hamburg, GER); Silke Schreiber-Barsch (University of Duisburg-Essen, GER); Katharina Angermeier (HAW Hamburg, GER) |
| London, UK | 6:00 PM | |
| Hamburg, GER | 7:00 PM | A2. The relationship between self-rated health and proficiency in numeracy and technological problem solving in the OECD countries Tina Dulam (Utrecht University School of Economics, NLD) |
| Singapur, SGP | 1:00 AM (Tue) | |
| Wellington, NZL | 5:00 AM (Tue) | |

Jane Marcet Room (Zoom-Room #2)

A3. Immigrant students' perspectives on language and mathematics learning in mathematics classrooms

Maike Lüssenhop; Ann Sophie Stuhlmann; Gabriele Kaiser (all University of Hamburg, GER)

A4. "What am I doing here?" Perceptions of Zimbabwean Adult numeracy learners in England.

Norman Maphosa (Manchester Adult Education Service, UK)

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|---------------------|----------------|-----------------------------|
| Vancouver, CAN | 11:30 AM | |
| New York, USA | 2:30 PM | |
| Brasília, BRA | 3:30 PM | |
| London, UK | 7:30 PM | Short break (30 Min) |
| Hamburg, GER | 8:30 PM | <i>Wonder Room</i> |
| Singapur, SGP | 2:30 AM (Tue) | |
| Wellington, NZL | 6:30 AM (Tue) | |

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|---------------------|----------------|--|
| Vancouver, CAN | 12:00 PM | |
| New York, USA | 3:00 PM | |
| Brasília, BRA | 4:00 PM | |
| London, UK | 8:00 PM | Keynote 3 (90 Min): |
| Hamburg, GER | 9:00 PM | The new literacies of automation: Justice in the digital era by Prof. Suzanne Smythe (Simon Frazer University, CAN) |
| Singapur, SGP | 3:00 AM (Tue) | <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| Wellington, NZL | 7:00 AM (Tue) | |

Tuesday, July 6th

| | | |
|---------------------|----------------|--|
| Vancouver, CAN | 12:00 AM | Parallel sessions / Workshops B (90 Min): |
| New York, USA | 3:00 AM | |
| Brasília, BRA | 4:00 AM | |
| London, UK | 8:00 AM | <i>Dorothy Vaughan Room (Zoom Room #1)</i> |
| Hamburg, GER | 9:00 AM | B1. Workshop: Reflecting on a numeracy framework under construction |
| Singapur, SGP | 3:00 PM | Kees Hoogland (HU University of Applied Sciences Utrecht, NLD) |
| Wellington, NZL | 7:00 PM | |
| | | <i>Jane Marcet Room (Zoom-Room #2)</i> |
| | | B2. Workshop: Perspectives on building financial skills and knowledge with families that are described as financially vulnerable. An exploration of approaches used in Money Matters, a new EU project and community based experiences. |
| | | Beth Kelly (University College London Institute of Education, UK), Linda Smith (Learning Unlimited, UK), David Kaye |

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|---------------------|-----------------|-----------------------------|
| Vancouver, CAN | 12:30 AM | |
| New York, USA | 4:30 AM | |
| Brasília, BRA | 5:30 AM | |
| London, UK | 9:30 AM | Short break (30 Min) |
| | | <i>Wonder Room</i> |
| Hamburg, GER | 10:30 AM | |
| Singapur, SGP | 4:30 PM | |
| Wellington, NZL | 8:30 PM | |

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|---------------------|-----------------|--|
| Vancouver, CAN | 1:00 AM | Parallel sessions / Workshops C (90 Min): |
| New York, USA | 5:00 AM | |
| Brasília, BRA | 6:00 AM | |
| London, UK | 10:00 AM | <i>Dorothy Vaughan Room (Zoom Room #1)</i> |
| | | C1. Democracy and mathematics revisited |
| | | Lena Lindenskov (Danish School of Education Aarhus University, DEN) |
| Hamburg, GER | 11:00 AM | |
| Singapur, SGP | 5:00 PM | C2. Numeracy, social (in)equality, and vulnerability: An analysis of media items about COVID-19 and implications for adult learning |
| Wellington, NZL | 9:00 PM | Iddo Gal (University of Haifa, ISR); Vince Geiger (Australian Catholic University, AUS) |
| | | |
| | | <i>Jane Marcet Room (Zoom-Room #2)</i> |
| | | C3. Experiences of personal and policy ‘failure’ for mathematics students in post-16 vocational education |
| | | Diane Dalby (University of Nottingham, UK) |
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| | | C4. Adults (19+) studying GCSE Mathematics in Further Education (FE) Colleges in England: Results of a pilot study |
| | | Jenny Stacey (Sheffield Hallam University/Chesterfield College, UK) |

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| Vancouver, CAN | 2:30 AM | Long break (180 Min) |
| New York, USA | 6:30 AM | <i>Wonder Room</i> |
| Brasília, BRA | 7:30 AM | |
| London, UK | 11:30 AM | |
| | | Social event: Virtual Sightseeing Tour through Hamburg |
| Hamburg, GER | 12:30 PM | With Rachel Mayr |
| Singapur, SGP | 6:30 PM | <i>Jane Marcet Room (Zoom-Room #2)</i> |
| Wellington, NZL | 10:30 PM | [for specific time and more information see page 7] |

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|---------------------|----------------|--|
| Vancouver, CAN | 5:30 AM | <p>Parallel sessions / Workshops D (90 Min):</p> <p><i>Dorothy Vaughan Room (Zoom Room #1)</i></p> <p>D1. Workshop: ALM Maths in Prison (MiP) Catherine Byrne (Teacher in Prison Education, IRL); Tatiana Harrison (DeForest Hamilton Juvenile Hall School at Sonoma County Alternative Education Programs, USA)</p> <p><i>Jane Marcet Room (Zoom-Room #2)</i></p> <p>D2. Helpless around mathematics' – an examination of the impact of high levels of mathematics anxiety on adult learners Maria Ryan (Mary Immaculate College, IRL); Olivia Fitzmaurice (University of Limerick, IRL); Patrick Johnson ((University of Limerick, IRL)</p> |
| New York, USA | 9:30 AM | |
| Brasília, BRA | 10:30 AM | |
| London, UK | 2:30 PM | |
| Hamburg, GER | 3:30 PM | |
| Singapur, SGP | 9:30 PM | |
| Wellington, NZL | 1:30 AM | |

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|---------------------|----------------|---|
| Vancouver, CAN | 7:00 AM | <p>Short break (30 Min) <i>Wonder Room</i></p> |
| New York, USA | 11:00 AM | |
| Brasília, BRA | 12:00 PM | |
| London, UK | 4:00 PM | |
| Hamburg, GER | 5:00 PM | |
| Singapur, SGP | 11:00 PM | |
| Wellington, NZL | 3:00 AM | |

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|---------------------|----------------|--|
| Vancouver, CAN | 8:30 AM | <p>Keynote 4 (90 Min): Financial numeracy and vulnerability by Prof. José Julián Coa-Alvira (Lehman College of The City University of New York, USA) <i>Ada Lovelace Room (Main Zoom-Room)</i></p> |
| New York, USA | 11:30 AM | |
| Brasília, BRA | 12:30 PM | |
| London, UK | 4:30 PM | |
| Hamburg, GER | 5:30 PM | |
| Singapur, SGP | 11:30 PM | |
| Wellington, NZL | 3:30 AM (Wed) | |

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|---------------------|----------------|---|
| Vancouver, CAN | 9:00 AM | <p>Short break (15 Min) <i>Wonder Room</i></p> |
| New York, USA | 1:00 PM | |
| Brasília, BRA | 2:00 PM | |
| London, UK | 6:00 PM | |
| Hamburg, GER | 7:00 PM | |
| Singapur, SGP | 1:00 AM (Wed) | |
| Wellington, NZL | 5:00 AM (Wed) | |

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|---------------------|----------------|---|
| Vancouver, CAN | 10:15 AM | <p>ALM Annual General Meeting (AGM, 75 Min) Chaired by Beth Kelly (ALM chair, University College London Institute of Education, UK) <i>If you have registered for the AGM, you will find the link to this event in your emails. For more information please refer to https://alm-online.net/about/agm-documents/</i></p> |
| New York, USA | 1:15 PM | |
| Brasília, BRA | 2:15 PM | |
| London, UK | 6:15 PM | |
| Hamburg, GER | 7:15 PM | |
| Singapur, SGP | 1:15 AM (Wed) | |
| Wellington, NZL | 5:15 AM (Wed) | |

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|---------------------|----------------|--|
| Vancouver, CAN | 11:30 AM | <p>Preparation break (30 Min) Time to prepare some food and decorating for the party.</p> |
| New York, USA | 3:30 PM | |
| Brasília, BRA | 4:30 PM | |
| London, UK | 7:30 PM | |
| Hamburg, GER | 8:30 PM | |
| Singapur, SGP | 3:30 AM (Wed) | |
| Wellington, NZL | 7:30 AM (Wed) | |

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|---------------------|----------------|--|
| Vancouver, CAN | 12:00 PM | <p>Conference party Food, talk, dance and poems <i>Ada Lovelace Room (Main Zoom-Room)</i></p> |
| New York, USA | 3:00 PM | |
| Brasília, BRA | 4:00 PM | |
| London, UK | 8:00 PM | |
| Hamburg, GER | 9:00 PM | |
| Singapur, SGP | 3:00 AM (Wed) | |
| Wellington, NZL | 7:00 AM (Wed) | |

Wednesday, July 7th

| | | |
|---------------------|----------------|--|
| Vancouver, CAN | 7:00 PM (Tue) | <p>Parallel (open end): Discussion groups for</p> <ul style="list-style-type: none"> - Keynote 1: Vulnerability in Adult Life – and how it affects Numeracy Practices - Keynote 2: The international reproduction of vulnerability in numeracy assessments <p><i>Dorothy Vaughan Room (Zoom Room #1)</i></p> |
| New York, USA | 10:00 PM (Tue) | |
| Brasília, BRA | 11:00 PM (Tue) | |
| London, UK | 3:00 AM | |
| Hamburg, GER | 4:00 AM | |
| Singapur, SGP | 10:00 AM | |
| Wellington, NZL | 2:00 PM | |

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|---------------------|----------------|---|
| Vancouver, CAN | 7:30 PM | <p>Long break <i>Wonder Room</i></p> |
| New York, USA | 10:30 PM | |
| Brasília, BRA | 11:30 PM | |
| London, UK | 3:30 AM | |
| Hamburg, GER | 4:30 AM | |
| Singapur, SGP | 10.30 PM | |
| Wellington, NZL | 2:30 PM | |

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|---------------------|-----------------|---|
| Vancouver, CAN | 1:00 AM | <p>Keynote 5 (90 Min): Climate change in the mathematics and numeracy classroom- Discussion with Prof. Chris Budd (University of Bath, Gresham College, UK) and a workshop chaired by Dr. Beth Kelly (ALM chair, University College London Institute of Education, UK) <i>Ada Lovelace Room (Main Zoom-Room)</i></p> |
| New York, USA | 4:00 AM | |
| Brasília, BRA | 5:00 AM | |
| London, UK | 9:00 AM | |
| Hamburg, GER | 10:00 AM | |
| Singapur, SGP | 4:00 PM | |
| Wellington, NZL | 8:00 PM | |

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|---------------------|-----------------|----------------------------|
| Vancouver, CAN | 1:30 AM | |
| New York, USA | 5:30 AM | |
| Brasília, BRA | 6:30 AM | |
| London, UK | 10:30 AM | Long break (60 Min) |
| Hamburg, GER | 11:30 AM | <i>Wonder Room</i> |
| Singapur, SGP | 5:30 PM | |
| Wellington, NZL | 9:30 PM | |

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|---------------------|-----------------|--|
| Vancouver, CAN | 2:30 AM | Parallel Sessions/ Workshops E (90 Min): |
| New York, USA | 6:30 AM | |
| Brasília, BRA | 7:30 AM | |
| London, UK | 11:30 AM | <i>Dorothy Vaughan Room (Zoom Room #1)</i> |
| Hamburg, GER | 12:30 PM | E1. Workshop: Inspiring Research: Then and Now |
| Singapur, SGP | 6:30 PM | Jeff Evans (Middlesex University, UK); Lynda Ginsburg (Rutgers University, USA); Anke Grotlüschen; Keiko Yasukawa (University of Technology Sydney, AUS) |
| Wellington, NZL | 10:30 PM | |
| | | <i>Jane Marcet Room (Zoom-Room #2)</i> |
| | | E2. Parallel (open end): Discussion groups for |
| | | - Keynote 3: The new literacies of automation: Justice in the digital ear |
| | | - Keynote 4: Financial numeracy and vulnerability |

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|---------------------|----------------|-----------------------------|
| Vancouver, CAN | 4:00 AM | |
| New York, USA | 8:00 AM | |
| Brasília, BRA | 9:00 AM | |
| London, UK | 1:00 PM | long break (120 Min) |
| Hamburg, GER | 2:00 PM | <i>Wonder Room</i> |
| Singapur, SGP | 8:00 PM | |
| Wellington, NZL | 12:00 PM | |

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|---------------------|----------------|---|
| Vancouver, CAN | 7:00 AM | |
| New York, USA | 10:00 AM | |
| Brasília, BRA | 11:00 AM | |
| London, UK | 3:00 PM | Keynote 6 (90 Min): |
| Hamburg, GER | 4:00 PM | Covid-19 and numeracy challenges by Prof. Kevin McConway (Open University, UK) |
| Singapur, SGP | 10:00 PM | <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| Wellington, NZL | 2:00 AM (Thu) | |

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| Vancouver, CAN | 8:30 AM | |
| New York, USA | 11:30 AM | |
| Brasília, BRA | 12:30 PM | |
| London, UK | 4:30 PM | Closing Words and Announcement ALM29 (30 Min): |
| Hamburg, GER | 5:30 PM | <i>Ada Lovelace Room (Main Zoom-Room)</i> |
| Singapur, SGP | 11:30 PM | |
| Wellington, NZL | 3:30 AM (Thu) | |

Keynotes

Keynote 1:
Vulnerability in Adult Life – and how it affects
Numeracy Practices
 by Prof. Anke Grotlüschen (University of Hamburg,
 GER)

Monday, July 5th 2021

Vancouver, CAN 3:30 AM

New York, USA 6:30 AM

Brasília, BRA 7:30 AM

London, UK 11:30 AM

Hamburg, GER 12:30 PM

Singapur, SGP 6:30 PM

Wellington, NZL 10:30 PM

Anke Grotlüschen is Professor of Lifelong Learning at the Faculty of Education at the University of Hamburg. Her work focuses on digital media and learning theory, adult education target group and interest research, literacy and basic education research, citizenship and cultural adult education. Anke is responsible for the German National Level One Survey (LEO) and is the speaker of the co-operative research project on Adult Numeracy (Hamburg Numeracy Project) with the UNESCO Institute for Lifelong Learning, the University of the Armed Forces and the University of Applied Sciences.

In this keynote, Anke Grotlüschen introduces the concepts and the relation of vulnerability and numeracy practices: We understand humans in societies as mutually dependent and therefore as vulnerable, and we see vulnerability as a genuine aspect of life. Vulnerability is necessary to open up for deep interpersonal relations, for being involved or moved and it is definitely a prerequisite for falling in love. Vulnerability means, we care – maybe for our loved ones, maybe about our jobs. Others can hurt us, but we trust them that they won't actually do it. This is how many wealthy and/or privileged adults in industrialized societies live. But some parts of our societies are not only vulnerable (i.e. in risk of) but they actually do get hurt by other individuals, their societies structures or institutions. They get inadequately paid or exploiting work contracts. We use the term vulnerability to specifically look into the various risks of being hurt, marginalized or excluded for different groups. We match research on numeracy skills and numeracy practices with this notion of vulnerability. Numeracy skills and practices decline over time and in higher age, they are socially gendered in their nature and distribution and cannot be discussed without reproduces stereotypes. Training does not necessarily address the most needy, and numeracy training needs to be understood much broader and more critical than as mere basic calculation.

Keynote 2:**Numeracy, vulnerability, ethics and social justice**

by Prof. Gelsa Knijnik (Universidade do Vale do Rio dos Sinos, BRA)

Monday, July 5th 2021

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|---------------------|-------------------|
| Vancouver, CAN | 8:00 AM |
| New York, USA | 11:00 AM |
| Brasília, BRA | 12:00 PM |
| London, UK | 4:00 PM |
| Hamburg, GER | 5:00 PM |
| Singapur, SGP | 11:00 PM |
| Wellington, NZL | 3:00 AM (Tuesday) |

Gelsa Knijnik is a retired professor of the Graduate Programme on Education at the Universidade do Vale do Rio dos Sinos, Brazil. She conducts research in the field of Mathematics Education from a socio-cultural perspective. Her academic trajectory is linked to ethnomathematical studies. She is the Chair of TSG # 52 Ethnomathematics at ICME-14, which will take place in Shanghai, this July.

Based on my work with the Brazilian Landless Movement, in my talk I will highlight the role numeracy can take in vulnerable social groups to contribute to overcome their precarious living situation. In this perspective, we can consider numeracy an (even if very small but still valuable) element of the complex processes to search for social justice. Nevertheless, to fulfil its role ethics must be central to our numeracy practices and studies. In a broader sense, in contemporaneity, more than ever, I would argue that ethics must be central to our everyday life if what is at stake is to have a more just and inclusive society.

Keynote 3:**The new literacies of automation: Justice in the digital era**

by Prof. Suzanne Smythe (Simon Fraser University, Burnaby, CAN)

Monday, July 5th 2021

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|---------------------|-------------------|
| Vancouver, CAN | 12:00 PM |
| New York, USA | 3:00 PM |
| Brasília, BRA | 4:00 PM |
| London, UK | 8:00 PM |
| Hamburg, GER | 9:00 PM |
| Singapur, SGP | 3:00 AM (Tuesday) |
| Wellington, NZL | 7:00 AM (Tuesday) |

Suzanne Smythe is Associate Professor of Adult Literacy and Adult Education in the Faculty of Education and Simon Fraser University in British Columbia, Canada. Her current research program is concerned with digital literacy pedagogies, digital justice, and equitable access to new technologies for youth and adults. Recent examples of this work can be found in the *International Review of Education* (2021) with Anea Wilbur and Emily Hunter, and in *Studies in the Education of Adults* (2020) with Klaus Buddeberg and Anke Grotlüschen. Dr. Smythe is the principal investigator of a new research grant awarded by the Canadian *Social Sciences and Humanities Research Council* that will explore with community organizations adults' experiences of digital and algorithmic inequalities, and possibilities for more just digital worlds and literacies.

The presentation describes examples of encounters between people, technologies, and algorithms that are drawn from research in community-based settings in North America, with particular attention to the phenomena of online job applications and e-recruitment platforms. Nonhuman decision-making is increasingly common in North American job search and other services, and becoming so in other jurisdictions. This is raising

important questions about the role of automation and algorithms in the production of precarious labour, and in the very meanings of literacy in a world that must contend with the pedagogies and politics of the nonhuman. What do these new literacies of automation mean for adult education research and practice, particularly in this pandemic moment? How might adult educators and researchers locate themselves within movements for literacy and justice in the digital era?

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| <p>Keynote 4: Financial numeracy and vulnerability by Prof. José Julián Coa-Alvira (Lehman College of The City University of New York, USA)</p> | <p style="text-align: center;">Tuesday, July 6th 2021</p> <table border="0"> <tr><td>Vancouver, CAN</td><td>8:30 AM</td></tr> <tr><td>New York, USA</td><td>11:30 AM</td></tr> <tr><td>Brasília, BRA</td><td>12:30 PM</td></tr> <tr><td>London, UK</td><td>4:30 PM</td></tr> <tr><td>Hamburg, GER</td><td>5:30 PM</td></tr> <tr><td>Singapur, SGP</td><td>11:30 PM</td></tr> <tr><td>Wellington, NZL</td><td>3:30 AM (Wednesday)</td></tr> </table> | Vancouver, CAN | 8:30 AM | New York, USA | 11:30 AM | Brasília, BRA | 12:30 PM | London, UK | 4:30 PM | Hamburg, GER | 5:30 PM | Singapur, SGP | 11:30 PM | Wellington, NZL | 3:30 AM (Wednesday) |
| Vancouver, CAN | 8:30 AM | | | | | | | | | | | | | | |
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| Hamburg, GER | 5:30 PM | | | | | | | | | | | | | | |
| Singapur, SGP | 11:30 PM | | | | | | | | | | | | | | |
| Wellington, NZL | 3:30 AM (Wednesday) | | | | | | | | | | | | | | |

José Julián Cao-Alvira is Professor of Finance and Economics for Lehman College of The City University of New York. He obtained a Ph.D. in Economics from Cornell University, and holds professional designations as a Certified Financial Planner (CFP) and Financial Risk Manager (FRM). His fields of research include microcredit banking, financial literacy, investment analysis, international trade and competitiveness. José Julián chairs the Research Division at PRIME Business School of the Universidad Sergio Arboleda in Bogotá, Colombia and actively serves as a Visiting Researcher at international academic institutions, being the Center for North and South Economic Research of the University of Sassari in Sardinia, Italy the most recent of these. José Julián’s most recent work, published in the Review of Development Economics, attempts to find the linkages that exist between financial numeracy and the indebtedness and wealth of households in Bogotá, the capital of Colombia.

In this keynote José Julián Cao-Alvira will speak about these linkages of financial literacy with indebtedness and wealth accumulation of households in Bogotá. The main question is about the relationship between the financial literacy and money management skills of the heads of households with the way households use and manage debt, the cost of debt servicing and several wealth indicators. Numeracy skills are found to have a positive correlation with the decision to use debt and have a mortgage and with the total number of lending sources, debt-to-income, and net worth. The speech uncovers important debt and wealth accumulation conducts closely tied to the city’s economic stratification and the gender of the head of household, thus discussing questions of unequal degrees of vulnerability. A number of public policy implications are derived from the results of the analysis.

Wednesday, July 7th 2021

Keynote 5:**Climate change in the mathematics and numeracy classroom**

Discussion with Prof. Chris Budd (University of Bath, Gresham College, UK) and

a workshop chaired by Dr. Beth Kelly (AML chair, University College London Institute of Education, UK)

Vancouver, CAN 1:00 AM

New York, USA 4:00 AM

Brasília, BRA 5:00 AM

London, UK 9:00 AM

Hamburg, GER 10:00 AM

Singapur, SGP 4:00 PM

Wellington, NZL 8:00 PM

Chris Budd OBE, is Professor of Applied Mathematics and Director of the Centre of Nonlinear Mechanics at the University of Bath, UK. He has a long history of engagement in the public understanding of science and mathematics through institutions such as the UK Royal Institution and the Institute of Mathematics and its Applications.

As a graduate of Oxford and Cambridge, Professor Budd has held the position of Professor of Applied Mathematics at the University of Bath for over twenty years. His other current positions include Chair of Mathematics at the Royal Institution at Great Britain since 2000, and Professor of the Public Understanding of Mathematics at the ICMS, Edinburgh, since 2015.

Professor Budd's broad research interests involve interdisciplinary industrial and applied mathematics. He has worked with the UK Met Office for over ten years and his algorithms are now incorporated into national operational weather forecasting. He is currently carrying out research on climate modelling using modern mathematical and computational methods and is actively involved in a number of international climate modelling networks, including CliMathNet, which he co-directs, and the Mathematics of Planet Earth programme. He also collaborates with the energy industry, the aerospace industry, the telecommunications industry and the food industry.

Discussion Title: Climate change in the mathematics and numeracy classroom

In a well-received webinar Professor Chris Budd describes how complex climate models work and the assumptions that go into them. He discusses the reliability of predictions of climate change, and shows how mathematics can give us insights into both past and future.

We are delighted that Professor Budd has agreed to join us for this discussion group and we will take his webinar available at <https://www.gresham.ac.uk/lectures-and-events/mathematics-climate-change> as a starting point for our discussion. When we can consider:

How mathematics lessons can be used to contribute to better understanding of the models involved in climate change?

How numeracy lessons can be use to critically look at media coverage of climate change?

We will then use the discussion group to explore further three aspects of the relationship between mathematics and climate change:

- exploring ideas highlighted in Professor Budd's seminar
- sharing resource ideas and approaches to teaching climate change through mathematics and numeracy

- possible ways that participants could develop resources or projects to support the better understanding of climate change through mathematics.

We look forward to an interesting debate and hope that participants can bring contributions and insights of their own to the discussion.

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| <p>Keynote 6: Covid-19 and numeracy challenges By Prof. Kevin McConway (Open University, UK)</p> | <p style="text-align: center;">Wednesday, July 7th 2021</p> <table border="0"> <tr> <td>Vancouver, CAN</td> <td>7:00 AM</td> </tr> <tr> <td>New York, USA</td> <td>10:00 AM</td> </tr> <tr> <td>Brasília, BRA</td> <td>11:00 AM</td> </tr> <tr> <td>London, UK</td> <td>3:00 PM</td> </tr> <tr> <td>Hamburg, GER</td> <td>4:00 PM</td> </tr> <tr> <td>Singapur, SGP</td> <td>10:00 PM</td> </tr> <tr> <td>Wellington, NZL</td> <td>2:00 AM (Thursday)</td> </tr> </table> | Vancouver, CAN | 7:00 AM | New York, USA | 10:00 AM | Brasília, BRA | 11:00 AM | London, UK | 3:00 PM | Hamburg, GER | 4:00 PM | Singapur, SGP | 10:00 PM | Wellington, NZL | 2:00 AM (Thursday) |
| Vancouver, CAN | 7:00 AM | | | | | | | | | | | | | | |
| New York, USA | 10:00 AM | | | | | | | | | | | | | | |
| Brasília, BRA | 11:00 AM | | | | | | | | | | | | | | |
| London, UK | 3:00 PM | | | | | | | | | | | | | | |
| Hamburg, GER | 4:00 PM | | | | | | | | | | | | | | |
| Singapur, SGP | 10:00 PM | | | | | | | | | | | | | | |
| Wellington, NZL | 2:00 AM (Thursday) | | | | | | | | | | | | | | |

Kevin McConway is Emeritus Professor of Applied Statistics at the Open University in the UK, where he taught statistics to adult students in a wide range of disciplines. He has researched collaboratively across natural and social science. Kevin McConway has developed a strong interest and involvement in statistics in the media. In particular he was as adviser for eleven years and an occasional contributor to the BBC radio programme More or Less, which aims to support the public understanding of data and research, and he has worked with and helped train journalists in understanding and communicating statistics, often through the UK’s Science Media Centre where he is a member of the advisory committee.

Kevin McConway will be discussing numeracy concerns that have come to the fore as a result of the pandemic. Some of the concerns, for example on understanding of risk, on dealing with numerical uncertainty, and on exponential growth have always been around, but have increased in salience and importance. Others, for example on the role of mathematical models in epidemiology, and on error types and rates in diagnostic tests, have become matters of public importance. Though mathematicians, statisticians, epidemiologists and educators have played a role in addressing these concerns, most of the work during this fast-moving crisis has been mediated through traditional media channels and social media. Those of us working on developing public understanding of statistics and mathematics therefore need to develop effective ways of engaging with these media. That’s not a simple matter, given the multiple competing interests and the vast number of actors involved. Kevin will argue that there have been some successes, some failures, and perhaps some pointers towards being more effective in the future

Short Abstracts (in order they appear in the programme)

Parallel Sessions and Workshops

A

| Monday, July 5 th 2021 | | |
|-----------------------------------|----------------|-----------|
| Vancouver, CAN | 10:00 AM | |
| New York, USA | 1:00 PM | |
| Brasília, BRA | 2:00 PM | |
| London, UK | 6:00 PM | |
| Hamburg, GER | 7:00 PM | |
| Singapur, SGP | 1:00 AM | (Tuesday) |
| Wellington, NZL | 5:00 AM | (Tuesday) |

Dorothy Vaughan Room (Zoom Room #1)

A1

**Numeracy practices and vulnerability under conditions of limited financial means:
"Without money, you can't survive or do anything or develop yourself"**

Wiebke Curdt (University of Hamburg, GER);

Silke Schreiber-Barsch (University of Duisburg-Essen, GER);

Katharina Angermeier (HAW Hamburg, GER)

Dealing with limited financial means is of particular interest considering its significance for participation in society and unfolding personal interests and objectives. Moreover, it elicits numeracy-related abilities and potential vulnerabilities that we would like to elaborate with regard to people in over-indebtedness and people with learning difficulties (also known as intellectual disability) in the context of their (numerate) environments (Evans et al. 2017).

We aim to analyze the encounter between numeracy practices, financial means, and vulnerability by referring to the approach on numeracy as social practice (Yasukawa et al. 2018) and following an anthropological viewpoint on a sociological-pedagogical perspective on vulnerability (Burghardt et al. 2017; Zirfas 2017).

To this end, we draw on findings from two qualitative research projects tackling the question of numeracy practices:

- numeracy practices of people with learning difficulties (Schreiber-Barsch et al. 2020; methodological approach: participatory research (Stalker 2014) and Grounded Theory Methodology (Corbin/Strauss 1990; Strübing 2014)); and

- numeracy practices of over-indebted persons (Angermeier/Ansen 2020; methodological approach: qualitative content analysis (Kuckartz 2018)).

The findings allow an intersectional perspective on numeracy practices under conditions of limited financial means by distinguishing disability- or debt-related nuances as well as similarities with regard to aspects of the numerate environment (Evans et al. 2017) and potential vulnerabilities. In conclusion, we aim to highlight the emancipatory potential of numeracy (Craig 2017) for adults' lifelong learning and participation in society.

Dorothy Vaughan Room (Zoom Room #1)

A2

The relationship between self-rated health and proficiency in numeracy and technological problem solving in the OECD countries

Tina Dulam (Utrecht University School of Economics, NLD)

Health-related decision-making not only requires the comprehension of various numerical information, including medication dosages, risk levels, and nutritional facts, but also the use of digital technology. Especially the latter is becoming increasingly necessary for accessing online patient and insurance information, navigating through the health care system, and thus managing your personal health in a technological complex environment. These requirements create a barrier for certain groups. People with a low proficiency in numeracy and digital tools may have difficulties in comprehending and managing health-related information and may therefore be more vulnerable to poor health outcomes. In this study, we use data from the three rounds (2011-12, 2014-15, and 2017) of the Programme for International Assessment of Adult Competencies (PIAAC) survey, and perform several logistic regressions. We study the relationship between the self-reported health status and the proficiency in numeracy and the use of digital tools (also called technological problem solving) in 30 OECD countries. Our analysis shows that 1) people who are less numerate, are more likely to report having a poor health, 2) people who are weak in technological problem solving are also more vulnerable to poor health, and 3) people who have a high level of technological problem solving proficiency, but a low numeracy proficiency are more likely to report having poor health than people with high levels of both type of proficiencies. In targeting health vulnerabilities, policies should be especially aimed at increasing the numeracy proficiency and not only the digital skills.

Jane Marcet Room (Zoom-Room #2)

A3

Immigrant students' perspectives on language and mathematics learning in mathematics classrooms

Maike Lüssenhop; Ann Sophie Stuhlmann;
Gabriele Kaiser (all University of Hamburg, GER)

Refugee children and young adults are seen as a vulnerable group with a diverse range of special needs. At the same time, many of them possess prior education and academic knowledge (i.e., rich multilingual knowledge). In the present study, we explore immigrant students' perspectives on mathematical and language learning in mathematics classrooms in international preparatory classes. Studying immigrant students' perspectives can provide an approach for addressing students' mathematical as well as multilingual competencies as a resource in the mathematics class- room.

Interviews were conducted with 13 students, which were analyzed using Grounded Theory Methodology. The interviews included discussions about challenges students face in mathematics class- rooms, as well as strategies for dealing with those challenges.

The interviews indicate that immigrant students do not distinguish between language and mathematical learning processes. From the students' perspective, mathematics and language learning seem

to go hand in hand. This is in line with results from mathematics education research showing that the understanding of mathematical structures and of linguistic constructions or expressions to represent these mathematical structures are closely connected. Students' own experience of this connection represents a basis for developing and discussing adequate learning strategies with them. Moreover, the study points out that students are highly interested in sharing and discussing mathematical knowledge acquired in origin or transit countries. Students could, for example, explain differing mathematical methods to their classmates, which would stimulate language learning processes as well as mathematical understanding.

Jane Marcet Room (Zoom-Room #2)

A4

"What am I doing here?" Perceptions of Zimbabwean Adult numeracy learners in England.

Norman Maphosa (Manchester Adult Education Service, UK)

Previous research suggests that one in five adults in England lack sufficient literacy and numeracy skills for employment and daily activities (DfES, 2006; Marsh, 2011). A number of adult numeracy strategies have been implemented in England such as Skills for Life and the current Functional Skills. These strategies arose from skills surveys and reviews such as the Wolf review of 2011. However, little research has been done on how these strategies support skills development of the migrant adult population and how migrants navigate through them as they draw their prior knowledge from different curricula delivered using different pedagogical approaches. This qualitative study investigated the views and experiences of Zimbabwean adult numeracy learners with the numeracy curriculum and teaching approaches in England. Data was collected through questionnaires and interviews with learners from three Adult Education Centres in England. Participants compared their numeracy learning in England with their learning of mathematics in Zimbabwe. Findings suggest that most participants believed that they already possessed higher mathematical skills than those offered in the Adult numeracy or Functional Skills Mathematics in England. Participants expressed disappointment in non-recognition of their Zimbabwean qualifications for progression into higher education in favour of level 2 Adult numeracy or Functional Skills qualifications. Within the numeracy classroom, participants found themselves confronted with social and cultural barriers such as contextualized tasks based on British context and language rather than mathematics skills which some described as easy, watered down and non-academic.

Parallel Sessions and Workshops

B

| Tuesday, July 6 th 2021 | |
|------------------------------------|----------------|
| Vancouver, CAN | 12:00 AM |
| New York, USA | 3:00 AM |
| Brasília, BRA | 4:00 AM |
| London, UK | 8:00 AM |
| Hamburg, GER | 9:00 AM |
| Singapur, SGP | 3:00 PM |
| Wellington, NZL | 7:00 PM |

Dorothy Vaughan Room (Zoom Room #1)

B1 Workshop

Reflecting on a numeracy framework under construction Kees Hoogland (HU University of Applied Sciences Utrecht, NLD)

Numeracy is about how people deal with the quantitative and multidimensional phenomena in the world around us, both in daily-life situations and professional contexts. In the latest and most state-of-the-art definitions of numeracy, it is described as a broad and multifaceted concept and as a social practice. It manifests itself in a plethora of observed numerate practices of people, showing that numerate behaviour is affected by cultural, social, personal, emotional traits, and societal power relations.

In 2019, funded by the European Union, an Erasmus+ project started under the name Common European Numeracy Framework (CENF) to create an overview of the relevant aspects which matter in the quality of numerate behaviour of citizen. This was based on a literature review on emergent themes in numeracy, a wide-scale European Numeracy Survey, and expert consultations. The main categories of aspects which were discerned, are: Content knowledge and skills, Context, Higher order skills, and Dispositions.

In the CENF, for each category and subcategory (e.g., Quantity and Number, Self-efficacy, Mathematizing) descriptions of observable numerate behaviour were developed. These descriptors are formulated as a rubric on six levels, so that they also give indications of possible learning trajectories. By this, teachers and learners in adult education can establish together which aspects of numerate behaviour can be addressed and improved.

In the workshop we will ask the participants to critically reflect on the rubrics for the (sub)categories of the framework.

Jane Marcet Room (Zoom-Room #2)

B2 Workshop

Perspectives on building financial skills and knowledge with families that are described as financially vulnerable. An exploration of approaches used in Money Matters, a new EU project and community based experiences.

Beth Kelly (University College London Institute of Education, UK),

Linda Smith (Learning Unlimited, UK),

David Kaye (London South Bank University, UK)

Research continues to show that families and households already facing significant financial insecurity, have had their situation worsened by the economic downturn caused by the Covid-19 pandemic (OECD, 2020, Social Metrics Commission (2020)).

The European Parliament (2015) and the OECD (2020) recommend financial education as one way to support individuals who are struggling to meet family budgets. In response a European funded project called Money Matters has just started. Through the project, organisations from six European Countries including the UK aim to develop useful financial skills and knowledge using an intergenerational learning approach. The project is focused on family groups from disadvantaged communities that might be classified as vulnerable and will involve training educators and family groups to access online learning resources that include comic books, escape rooms and apps through a digital library.

While the term financial literacy or capability is often used Gal, Grotlüschen, Tout, and Kaiser (2020) point to research that suggests the term financial numeracy might better describe the skills needed to deal with debt and other financial problems. Interestingly, an experienced manager of a local advice centre in London, that gives financial advice, stated she never thought her work had anything to do with mathematics or numeracy. Her starting point was basically people have financial problems because they do not have enough money!

This workshop will explore the concepts of financial literacy, numeracy and vulnerability and the role that digital technology can play supporting families to develop financial decision-making skills. We will ensure time is given to participants' own experiences of developing financial literacy in theory and practice.

Parallel Sessions and Workshops

C

| Tuesday, July 6 th 2021 | |
|------------------------------------|-----------------|
| Vancouver, CAN | 1:00 AM |
| New York, USA | 5:00 AM |
| Brasília, BRA | 6:00 AM |
| London, UK | 10:00 AM |
| Hamburg, GER | 11:00 AM |
| Singapur, SGP | 5:00 PM |
| Wellington, NZL | 9:00 PM |

Dorothy Vaughan Room (Zoom Room #1)

C1

Democracy and mathematics revisited

Lena Lindenskov (Danish School of Education Aarhus University, DEN)

The long-standing tradition of adult learning in Denmark underlines in its written founding documents to empower adults and encourage them to participate in democracy and to offer instruction which appeals to participant' active involvement. As many share these ideals, the world over, I think the following three questions are worth to explore in ALM. What can participation in numerical practices for democracy mean in today's societies? How can you demonstrate and enhance adults' numerical practices in instruction for democracy? How can democratic aspects of numerical practices be documented in large-scaled and small-scaled studies?

In my view, Nordic understandings of mathematics education for democracy from around 1990 (Mellin-Olsen 1987, Niss 1994, Skovsmose 1990) still have meaningful messages for today. When combined with newer results underlined in Yasukawa et al. (2018), I conclude with a didactical model for mathematics education and democracy.

This model consists of two dimensions. One dimension shows formal versus informal systems, rights and possibilities for participating. Another dimension shows the classical didactical questions on why teach mathematics, what to teach, who to teach and how to teach. I will exemplify each part of the model with some instruction content and organization.

Dorothy Vaughan Room (Zoom Room #1)

C2

Numeracy, social (in)equality, and vulnerability: An analysis of media items about COVID-19 and implications for adult learning

Iddo Gal (University of Haifa, ISR);
Vince Geiger (Australian Catholic University, AUS)

Media news and official statistics regarding the COVID-19 pandemic have repeatedly shown that language, ethnic, and religious minorities in multiple countries are vulnerable, with higher infection and death rates, and lower vaccination rates, compared to mainstream groups. This presentation examines

the capabilities needed to understand the mathematical and statistical information included in the COVID-19 pandemic media, given the criticality of such information for the well-being and practices of all citizens, including from vulnerable groups.

In view of the dearth of systematic empirical research on the actual numeracy demands in mainstream media, we content-analysed a purposive sample of over 300 'media items' (e.g., articles, videos) selected from news sources based in four countries with different demographic and pandemic-related profiles. We sketch a broad typology of nine categories that emerged of new or enhanced types of knowledge and skill demands needed to understand the quantitative and statistical news communicated to the general public about the pandemic. Illustrations will highlight capabilities that vulnerable groups need to understand their own status, such as demands for comparative thinking (e.g., regarding infection and death rates), literacy and language skills, understanding official statistics, critical interpretation, and modelling.

The capabilities identified in this analysis can affect individual and community-level practices related to numeracy and health, and to coping with misinformation. Hence, they are key for stakeholders interested in adult competencies and social equality. Yet, most of these capabilities are not sufficiently addressed in conceptual frameworks or numeracy curricula. Implications for instructional activities and social interventions will be discussed.

Jane Marcet Room (Zoom-Room #2)

C3

Experiences of personal and policy 'failure' for mathematics students in post-16 vocational education

Diane Dalby (University of Nottingham, UK)

Mathematics skills are a priority for many countries due to the economic returns but the implications for personal progression and income later in life also indicate the value for individuals in society. Using case study data from a study of further education colleges in England, we explore how students categorised as 'failures' in mathematics at age 16 are affected by government policy in the following years.

In England, students take high-stake GCSE qualifications at age 16 but those who fail to reach a specified minimum standard in mathematics are required to continue studying the subject. Due to the 'gate-keeping' function of GCSE qualifications, the majority of these follow vocational pathways post-16. The study shows how 'failure' in the GCSE mathematics examination undermines confidence and reinforces negative attitudes, affecting students' motivation, engagement and progression with mathematics as well as their career paths and aspirations.

These students' post-16 learning trajectories are also subject to constraints due to a policy that promotes the exchange value of a GCSE mathematics qualification above the development of vocationally relevant mathematics skills and college systems that influence their learning trajectories but offer few choices. We examine how, in these conditions, students experience a 'bounded agency' concerning their mathematics learning and future lives. Despite a policy intended to improve students' mathematics, the experiences and outcomes of this cohort often increase their vulnerability rather than providing them with the agency and opportunity to make progress.

Jane Marcet Room (Zoom-Room #2)

C4

**Adults (19+) studying GCSE Mathematics in Further Education (FE) Colleges in England:
Confidence, anxiety and performance**

Jenny Stacey (Sheffield Hallam University/Chesterfield College, UK)

GCSE mathematics is the age-16 general qualification obtained in schools in England. It is a marker examination for learners' journeys into university. In England in June 2020, over 30 000 learners of 19 years or more were enrolled for the Level 2 GCSE examination in mathematics, as a grade 4 or better can be an entrance requirement. Many of these learners may have left school at 16 years old with a range of Level 2 qualifications, and some may not have English as their first language or may not have been educated in the UK.

Adults who re-engage with mathematics after a break can do so for many reasons including career changes, which can expand opportunities and enhance earnings. Success in mathematics, combined with "Access to Higher Education" courses, can lead to professional training as nurses, teachers or social workers. In turn this can ensure more secure employment, potentially reducing adults' economic vulnerability.

Previous practitioner-based research with adults revealed levels of anxiety about both mathematics and examinations. This has led to a mixed method investigation to gather learners' confidence and anxiety levels, using a questionnaire based on several pre-existing surveys. Using thematic analysis, learners' perceptions will be compared to examination performances to evaluate for correlative links, via learner characteristics, such as age and gender.

This presentation is about the results of the pilot study and I will also present some impacts of the pandemic on the main investigation.

Parallel Sessions and Workshops

D

| Tuesday, July 6 th 2021 | |
|------------------------------------|---------------------|
| Vancouver, CAN | 5:30 AM |
| New York, USA | 9:30 AM |
| Brasília, BRA | 10:30 AM |
| London, UK | 2:30 PM |
| Hamburg, GER | 3:30 PM |
| Singapur, SGP | 9:30 PM |
| Wellington, NZL | 1:30 AM (Wednesday) |

Dorothy Vaughan Room (Zoom Room #1)**D1 Workshop****ALM Maths in Prison (MiP)**

Catherine Byrne (Teacher in Prison Education, IRL); Tatiana Harrison (DeForest Hamilton Juvenile Hall School at Sonoma County Alternative Education Programs, USA)

Maths in Prison (MiP) topic group is a new initiative from Adults Learning Maths (ALM) and is aimed at linking practitioners and researchers interested in Maths education in prisons and the secure estate. The topic group grew from the ALM series of virtual seminars which replaces our 2020 conference, cancelled due to Covid. Interest was expressed by those attending to develop an international group focusing on the particular challenges and opportunities afforded to adults learning Maths in this context.

Education in prisons is under theorised despite its wide existence across the world (Szifris 2018). Maths education in prison is a more limited field of research still. Recent research (Ahl 2020) has added to the field. Anecdotal evidence from practitioners shows that prisoners and people in detention have unmet needs in Maths and numeracy.

Maths education in prison is a basic life skill (Council of Europe 1990). Levels have been investigated in prisons in the UK (Creese 2016) and the USA (Rampey et al 2016). Priority is given to those in prison with basic educational needs, including numeracy and literacy (Irish Prison Service 2019). Coates (2016) advocates for development of basic skills in mathematics, as well as English, and Information and Communications Technology (ICT) in UK prisons.

This group offers a forum to share good practice, discuss methodologies and challenges for practitioners and researchers. We encourage informal

conversations between practitioners to identify common themes and look to ways to support Maths education in this context. We share experiences, literature, and best practices on topics such as teaching fractions and how technology can support. In this workshop we plan to give an overview of our progress to date and our plans for the future.

Jane Marcet Room (Zoom-Room #2)

D2

‘Helpless around mathematics’ – an examination of the impact of high levels of mathematics anxiety on adult learners

Maria Ryan (Mary Immaculate College, IRL); Olivia Fitzmaurice (University of Limerick, IRL); Patrick Johnson (University of Limerick, IRL)

Adult learners who have had adverse past experiences of doing mathematics can find it difficult to move beyond the impact of those experiences when faced with situations involving mathematics and numbers. For some, these experiences give rise to mathematics anxiety, materialising through intense negative feelings towards mathematics and influencing how they approach the subject. Highly mathematics anxious adult learners frequently perceive themselves to be no good, incompetent or helpless around mathematics; and they are more likely to resort to coping mechanisms in order to get through the mathematics content in their programme of study. In everyday situations, the highly mathematics anxious adult will likely struggle with common scenarios involving handling numbers and engaging in calculations. With this backdrop, the paper reports how high levels of mathematics anxiety impact adult learners in academic and everyday contexts. The findings of this mixed methods study show that past experiences substantially impact on the adult learner’s predisposition to being anxious about mathematics and contribute significantly to how they prepare for and engage with mathematics and numbers. Despite being highly anxious about mathematics, these learners can persevere, and demonstrate resilience in spite of the mathematical challenges facing them.

Parallel Sessions and Workshops

E

| Wednesday, July 7 th 2021 | |
|--------------------------------------|-----------------|
| Vancouver, CAN | 2:30 AM |
| New York, USA | 6:30 AM |
| Brasília, BRA | 7:30 AM |
| London, UK | 11:30 AM |
| Hamburg, GER | 12:30 PM |
| Singapur, SGP | 6:30 PM |
| Wellington, NZL | 10:30 PM |

Dorothy Vaughan Room (Zoom Room #1)

E1 Workshop

Inspiring Research: Then and Now

Jeff Evans (Middlesex University, UK); Lynda Ginsburg (Rutgers University, USA);
Anke Grotlüschen; Keiko Yasukawa (University of Technology Sydney, AUS)

This workshop originated with the idea that particular writings in our field – adults' mathematics/ numeracy – have affected the direction of our thinking. We shall discuss how some features of each source could still inspire today. The contributors all make ongoing contributions to our field through their own research and supporting that of others. Each will introduce one key influence from the beginning of their career, and another discovered more recently.

Lynda Ginsburg: Mine would include Nunes, Schliemann and Carraher's Street Mathematics and School Mathematics, and also Deborah Ball's work on teacher learning / knowing mathematics for teaching.

Anke Grotlüschen: Most of my students work with Klaus Holzkamp's "socio-materialist" learning theory, part of the "critical psychology" movement in Germany. Recently, I discovered Adam Ries (1492-1559), who was of comparable influence to Gutenberg and his printing press. Ries introduced Arab calculation in Germany, and particularly the Zero (close to blasphemy!), so that the "common man" would be able to control what he paid for bread or for taxes.

Keiko Yasukawa: One of mine would be Mike Rose, *The Mind at Work: The intelligence of the American Worker*.

Jeff Evans: I shall mention Jean Lave's work, esp *Cognition in Practice* (1988). Later, I discovered Steve Reder's work, e.g. (2011) on local literacy surveys and practice engagement theory.

Each of us will mention empirical contributions, theoretical insights, and methodological innovations, showing their continuing relevance today.