

MEI
Conference
2018

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Bringing research into the maths classroom

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(MEI Research and
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About MEI

- Registered charity committed to improving mathematics education
- Independent UK curriculum development body
- We offer continuing professional development courses, provide specialist tuition for students and work with employers to enhance mathematical skills in the workplace
- We also pioneer the development of innovative teaching and learning resources

Questions – for you...

- Are you a teacher, an academic, work in industry...
- Do you have any specific interest in maths education research and/or publications?
- What do you hope you might get out of the session?

Session description

- In 2017 the Chartered College of Teaching came into existence, with one of its founding aims being to ‘enable teachers to connect with rigorous research and evidence’.
- This session will look at ways to keep up-to-date with developments in maths education and consider some articles and reports.
- It will also give insight into some of the publications MEI staff have authored in recent years.

Maths Education Publications

- Depending on where you are coming from the term ‘publication’ can mean different things
 - *Publication of research undertaken individually or collaboratively*
 - *Publication of personal reflections, i.e. blogs/articles*
 - *Publication of reports on specific projects*
 - *Publication by or on behalf of organisations/government*
- For ‘research’ there exists a continuum of ‘value’, depending on the ‘ranking’ of journals published in

The good, the bad and the...

...non-peer reviewed!

Many, many excellent 'academic' publications that get 'very little attention' because of their availability, but...

...conversely some 'publications' are made freely available into the public domain and get a big 'media' presence, without necessarily going through any rigorous peer-review process.

Check the context upon which you are reading something!

Chartered College of Teaching

- DfE funding until 2020 (up to £5m)
- Membership fees
£45 per year (teacher/affiliate)
- Chartered Teacher (CTeach)
£850 (£450 in pilot year)
- Chartered Mathematics Teacher (CMathTeach) has been available since 2010 via a consortium of professional bodies - ATM/IMA/MA/NANAMIC, see: www.cmathteach.org.uk/ (£30/year subscription)

Chartered College of Teaching

A new journal for teachers



- Designed for a teacher audience - with teacher submissions
- Focused on classroom practice
- Original research and examples of seminal research used in practice
- Termly, themed and peer-reviewed
- Guest editors
- Eminent editorial board
- Online edition with additional content for student teachers

Chartered College of Teaching

Research databases that you gain access to:

- British Education Index
- Child Development & Adolescent Studies
- EBSCO eClassics Collection
- Education Abstracts (H.W. Wilson)
- Education Research Complete
- Education Source
- Education Resource Information Center
- Educational Administration Abstracts

Search within this publication

Publication Details For "*British Educational Research Journal*"

Title: British Educational Research Journal

ISSN: 0141-1926

Publisher Information: Wiley-Blackwell
9600 Garsington Road
Oxford OX4 2DQ
United Kingdom of Great Britain & Northern Ireland

Bibliographic Records: 04/01/1978 to present

Full Text: 03/01/1990 to present (with a 12 Month delay)
*Full text delay due to publisher restrictions ("embargo")

Publication Type: Academic Journal

Subjects: Education (General); Great Britain

Description: An international forum for articles of interest to researchers in education.

Publisher URL: <http://www.wiley.com/WileyCDA/>

Frequency: 6

Peer Reviewed: Yes

‘Academic’ Publications

- Accessing the materials can often be difficult and/or expensive (if you’re not in an academic/university environment)
 - Journals
 - Membership publications
 - Conference proceedings, i.e. hard copy only
 - Though a changing situation with ‘open-access’ (free) sites and electronic proceedings

MEI are here to keep you informed!

- Are you aware of the MEI 'Reports/Publications' webpages?



Continuously developing our innovative resources to support teaching and learning.

- [Books](#)
- [Integral Resources](#)
- [Past Papers](#)
- [Free Resources](#)
- [Useful Links](#)
- [Live Session Support](#)
- [Item of the Month](#)
- [Data Sets](#)
- [Reports/Publications](#)

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[Reports/Publications](#)

- [Position Papers](#)
- [External Reports](#)
- [MEI Reports](#)
- [Staff Publications](#)

Reports

This page provides links to a number of publications relating to mathematics education. The relevant publications include reports and letters published by external organisations and reports, articles and conference papers prepared by MEI staff.

Please use the links below to navigate to pages containing more information.

Position Papers: MEI produces papers detailing where we stand on key issues affecting mathematics education.

External reports: Reports (and letters) relating to mathematics education

MEI Staff Publications: Reports, articles and conference papers prepared by MEI staff

Suggest a report

If you would like to suggest a report to be included on this page please contact:
[Stephen Lee](#)



**Advanced Mathematics
Support Programme**

Programme launch

View it live streamed from the
MEI Conference 2018

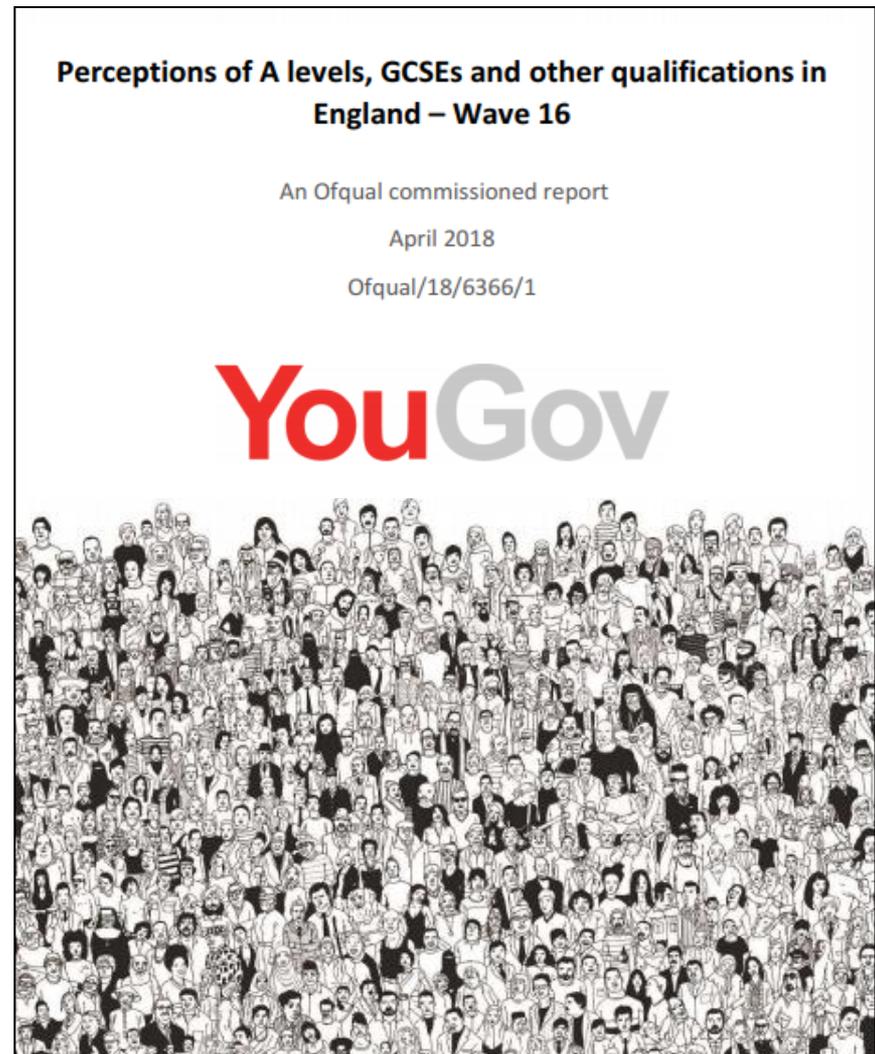
Thursday 28 June 17:15

Some 'relevant' research

- Perceptions of AS/A levels, GCSEs and Other Qualifications in England (YouGov) GCSE and A level
- REVAMP (Nottingham University) A level
- The Maths needs of HE (Cambridge Assessment) A level to University
- Hiccups within technology mediated lessons Various levels

YouGov report

- 49 pages (+ 25 Methodology)
- Chapters on:
 - Composite confidence measure
 - Perceptions of GCSEs
 - Perceptions of AS/A levels
 - Perceptions of Applied General Qualifications
 - New 9 to 1 grading scale
 - National reference test
 - The review of marking, moderation and appeals
 - Special considerations
 - Appeals



YouGov report

Responses:

261 head teachers

640 teachers of GCSE, A level and other academic² and vocational qualifications³ offered to people aged 14 to 19 years (referred to throughout this report as teachers)

275 young people, defined as those aged 14 to 19 years who are studying/have studied/will study AS/A levels and/or GCSEs and/or an academic qualification defined as functional skills, Level 1/2 certificates (eg Pearson Level 1/2 BTECs and OCR Cambridge National Certificates), Level 3 tech levels (eg Pearson Level 3 BTECs and OCR Cambridge Technical Certificates) or applied general qualifications

271 parents/carers of students who are taking or who have just taken AS/A levels, GCSEs and/or other academic qualifications described above

250 academic professionals⁴ who had knowledge about the process of offering applicants a place on an undergraduate course at their institution (referred to throughout this report as HEIs)

262 senior/middle managers who worked for an organisation that has recruited young people (aged 16 to 25 years) in the past 12 months (referred to throughout this report as employers)

1,015 members of the public

Overall:
Confidence in
GCSE and A level
systems!

REVAMP research project

- Rethinking the Value of Advanced Mathematics Participation – Nuffield Foundation (£156,733) June 2013 to December 2016
- Other (current/recent) Nuffield funded maths projects:
 - **Mathematics in Further Education Colleges**
[Nottingham University, £256,298, September 2017 to November 2019]
 - **The early take up of Core Mathematics,**
[University of Leeds, £256,285, March 2017 to Feb 2020]
 - **Low attainment in maths: an investigation of Year 9 students,**
[Nottingham/Kings/Durham, £245,066, Sept 2015 to Feb 2018]
 - **Developing teachers' mathematical knowledge using digital technology,**
[IOE UCL, £198,439, December 2014 to April 2017]
 - **Achievement and attitudes in GCSE maths resit classes**
[MMU, £82,202, December 2014 to May 2017]
 - **Using lesson study for teaching mathematical problem-solving**
[University of Nottingham, £170,565, Jan 2014 to Dec 2016]
 - **Understanding mathematics anxiety**
[Cambridge/Oxford, £201,633, Oct 2013 to Oct 2017]
 - **Measuring conceptual understanding in mathematics**
[Loughborough University, £129,909, Oct 2013 to Oct 2016]

REVAMP research project

- Publications:
 - Noyes A, and Adkins M (2016) Studying advanced mathematics in England: findings from a survey of student choices and attitudes. **Research in Mathematics Education**
 - Adkins M, and Noyes A (2016) Reassessing the economic value of advanced level mathematics. **British Educational Research Journal**
 - Noyes A, and Adkins M, (2016) Reconsidering the rise in A-Level Mathematics participation. **Teaching Mathematics and its Applications**
 - Noyes A and Adkins M, (2016) The Impact of Research on Policy: A Case of Qualifications Reform. **British Journal of Educational Studies**

- Final report:

www.nottingham.ac.uk/education/documents/research/revamp-final-report-3.1.17.pdf

REVAMP research project

- 33 page final report, which cites four strands of quantitative analysis:
 - Updated research on economic returns to A level Mathematics
 - Analysis of changing participation in A level Mathematics from 2005-13
 - Modelling of the relationship between A level Mathematics and degree outcomes
 - A national survey of ten thousand 17-year-old

The Maths needs of HE

Cambridge Assessment project into the mathematical needs of HE

- Bowyer, J. & Darlington, E. (2017) Mathematical struggles and ensuring success: post-compulsory mathematics as preparation for undergraduate bioscience. **Journal of Biological Education**
- Darlington, E. & Bowyer, J. (2017). The mathematics needs of prospective geography undergraduates. **Journal of Research in Social Sciences**
- Bowyer, J. & Darlington, E. (2017) Should I take Further Mathematics? Physics undergraduates' experiences of post-compulsory Mathematics. **Physics Education**
- Darlington, E. and Bowyer, J. (2017) Decision Mathematics as Preparation for Undergraduate Computer Science. **International journal of Modern Education and Computer Science**
- Darlington, E., and Bowyer, J. (2017). The Mathematics Needs of Prospective Geography Undergraduates. **Journal of Research in Social Sciences (JRSS)**
- Darlington, E. and Bowyer, J. (2017). The role of 'extension papers' in preparation for undergraduate mathematics: students' views of the MAT, AEA and STEP. **Teaching Mathematics and its Applications**

The Maths needs of HE

- Darlington, E. & Bowyer, J. (2016) Accounting for students' mathematical preparedness for Finance and Business degrees. **Research Matters**
- Darlington, E. & Bowyer, J. (2016) Engineering undergraduates' views of A-level Mathematics and Further Mathematics as preparation for their degree. **Teaching Mathematics and its Applications**
- Darlington, E. & Bowyer, J. (2016) How well does A-level Mathematics prepare students for the mathematical demands of chemistry degrees? **Chemistry Education Research and Practice**
- Darlington, E. & Bowyer, J. (2016) The Mathematics needs of prospective Architecture undergraduates. **Research Matters**
- Darlington, E. & Bowyer, J. (2016) Students' views of, and motivations for, studying A-level Further Mathematics. **MSOR Connections**, 15(1), 4-13. Available: <https://journals.gre.ac.uk/index.php/msor/article/view/329>

Overarching findings

Survey response from over 4000 undergraduates.
2,250 had previously studied AS or A level Further Mathematics.

“Undergraduates of STEMM and Social Science subjects who took AS or A-level Further Mathematics prior to going to university generally enjoyed studying it and believed that it was beneficial preparation for the mathematical demands for their degree.”

“Students’ motivations for studying Further Mathematics reflected the varying mathematical demands of undergraduate courses.”

“prior success in Mathematics was a strong motivating factor for many participants”

Subject specific example

Paper title:

Hiccups within technology mediated lessons: a catalyst for mathematics teachers' epistemological development

- Clark-Wilson, A; Noss, R (2015) Research in Mathematics Education, 17 (2) pp. 92-109.
- Part of the previously stated Nuffield Project:
Developing teachers' mathematical knowledge using digital technology, [IOE UCL, £198,439, December 2014 to April 2017]

Abstract

- The notion of the lesson ‘hiccup’, defined as the perturbation experienced by a teacher during teaching that has been triggered by the use of mathematical technology, was first proposed in Clark-Wilson (2010).
- Hiccups which are both unanticipated and unplanned, emerged from a study that sought to make sense of the process of secondary mathematics teachers’ situated learning as they began to use a particular new technological tool (TI-Nspire™ handheld devices and software) in their classrooms.
- The high frequency of the resulting hiccups enabled a categorisation of seven hiccup types that were shown to have influenced the development of teachers’ mathematical, pedagogic and technological knowledge.
- This article first reports and then extends this earlier work by articulating the design principles for a professional development approach within the Cornerstone Maths (CM) project that uses hiccups to try to address professional development ‘at scale’ concerning student use of dynamic digital technologies in mathematics classrooms.

How to get involved?

Move into Higher Education yourself...

- Alison Clark-Wilson was a Head of Maths and Advanced Skills Teacher in schools until 2000, before turning to research (obtained a PhD in 2010)
<https://iris.ucl.ac.uk/iris/browse/profile?upi=ACLAR76>

British Society for Research into Learning Mathematics

- £35/year membership
- Three 'day' conferences per year with associated proceedings (+more, i.e. journals)

MEI publications

- See website:
[http://mei.org.uk/
staff-publications](http://mei.org.uk/staff-publications)
- General strategy
to write in
'accessible'
places that are
freely available
to be read

Staff Publications

In Press/Submitted

de Pomerai, S & Tripconey, S

How do online professional learning courses compare with face-to-face?
Proceedings of British Congress on Mathematics Education

Barker, D

What aspects of professional development courses do mathematics teachers find effective? Hearing their voice
Proceedings of British Congress on Mathematics Education

2018

Button, T & Lee, S (2018)

MEI Insights 2018: Problem Solving with Technology
Mathematics in School, Mathematical Association.

Lee, S, Lord, K, Dudzic, S & Stripp, C (2018)

Investigating the impact of curriculum and funding changes on Level 3 mathematics uptake: Comparison of Level Mathematics/Further Mathematics and Core Maths uptake in 2016-17 and 2017/18.
MEI Report.

Lee, S (2018)

MEI Insights 2018: Monthly Maths
Mathematics in School, Mathematical Association, Vol. 47 Issue 1.

Stripp, C (2018)

What's Wrong with Maths GCSE? Addressing Fundamental Problems at the Heart of the New Exams
Teach Secondary Magazine, January 2018

2017

Lee, S, Saker, C & Baldwin, C (2017)

Universities as a driver of AS/A level uptake: the case of Maths and Further Maths.
British Society for Research into Learning Mathematics

Baldwin, C & Lee, S (2017)

Exploring the new AS and A levels in Mathematics and Further Mathematics
The Institute of Mathematics and Its Applications (IMA) Mathematics TODAY

Dudzic, S & Lee, S (2017)

Assessing new mathematics curricula 16-18 – lessons from developing Core Maths and A level Maths qualifications

How to keep up to speed...

...on 'recent reports'

- Social Media – Twitter / Facebook / Blog posts
- Distribution/newsletter mailing lists
- Websites, i.e. MEI reports pages!

...on 'research publications'

More difficult due to some 'access' issues, but as above and:

- Review relevant conference proceedings
- Periodically check 'free' journal database sites, at least for 'titles', e.g. www.jstor.org, <http://scholar.google.co.uk> <http://doaj.org>
- Ask for updates from academics in your area of interest

What to take away?

- Some ideas for where you might access up-to-date publications
- A wider appreciation of the different mediums for publications as well as the range
- The belief that undertaking, collaborating and sharing of work and thoughts on mathematics education and publishing them is a good thing!

Questions

- What are good mechanisms for maintaining up to date knowledge of mathematics education reports and research?
- How can collaboration best be facilitated between teachers and mathematics education researchers?