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Mathematics in Further Education Colleges (MiFEC)

Summer Update 2018

Welcome to our summer update which provides a brief update on progress with the project since September 2017 and presents a few of the emerging findings.

Policy changes continue to impact FE colleges with T-levels under development, the review of functional skills and Centres for Excellence on the horizon. These initiatives have potential for positive impact but system change is complex and policy changes can produce unintended and unhelpful side effects. Our early findings from the project offer some insight into how policy is being enacted and shaping practice in four strands: 1) A national policy trajectory analysis and literature review; 2) Analyses of student progression over time; 3) Case studies of Further Education colleges; and, 4) A survey of the mathematics teacher workforce.

What has been happening?

Strand 1: National policy trajectory analysis and literature review.

We have reviewed literature from the last 20 years including academic papers and reports from government, independent bodies and stakeholders. Our database and timeline highlight the development of influential ideas that have shaped the present curriculum. Sector experts are being consulted on possible additions to the timeline, which can be found on the project website: https://www.nottingham.ac.uk/research/groups/crme/projects/mifec/index.aspx.

Strand 2: Analyses of student progression over time

The Next Steps cohort study provides information about the education and employment of a cohort of students from age 13/14 through to age 25 (in 2016). The analysis is ongoing and includes the numbers of students from this cohort (GCSE in 2006) who studied in FE, the maths qualifications they completed and their employment at age 25.

Strand 3: Case studies of Further Education colleges

Publicly available data were used to select an initial balanced sample of case studies comprising six providers (i.e. individual colleges or college groups) from different regions. After initial phone interviews with college principals, interviews with staff and meetings with students took place. In total there have been 23 student focus groups and 73 individual interviews involving mathematics teachers, managers and vocational staff. A second sample of providers from across England has been invited to join phase two. In total, 32 providers have agreed to take part and documentary evidence is being collected prior to visits in 2018/19.

Strand 4: Survey of the mathematics teacher workforce

During June and July 2018 a national survey of maths teachers at these colleges was conducted. Teachers were asked about their teaching experience, roles and responsibilities, job satisfaction, prior occupation, training and CPD. 428 teachers completed the survey (estimated response rate 55%).

What colleges are saying

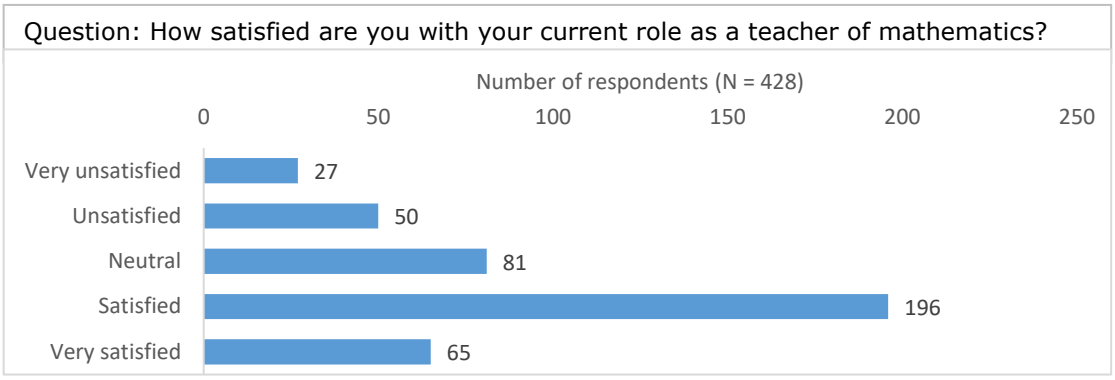
A number of themes are emerging from our early analysis of case study data. Some will be familiar to those working in FE colleges (N.B. these early themes are subject to modification as the analysis progresses). The emerging issues at this point in the analysis include:

- *A trend away from Functional Skills Mathematics towards GCSE Mathematics.* This is partly due to the importance of mathematics progress measures to colleges, coupled with the increased difficulty of Level 2 Functional Mathematics and its unsuitability as a 'stepping-stone' to GCSE. There is evidence of tension though, between allowing lower-grade students to attempt GCSE to improve their grade and the effects of repeated failure.

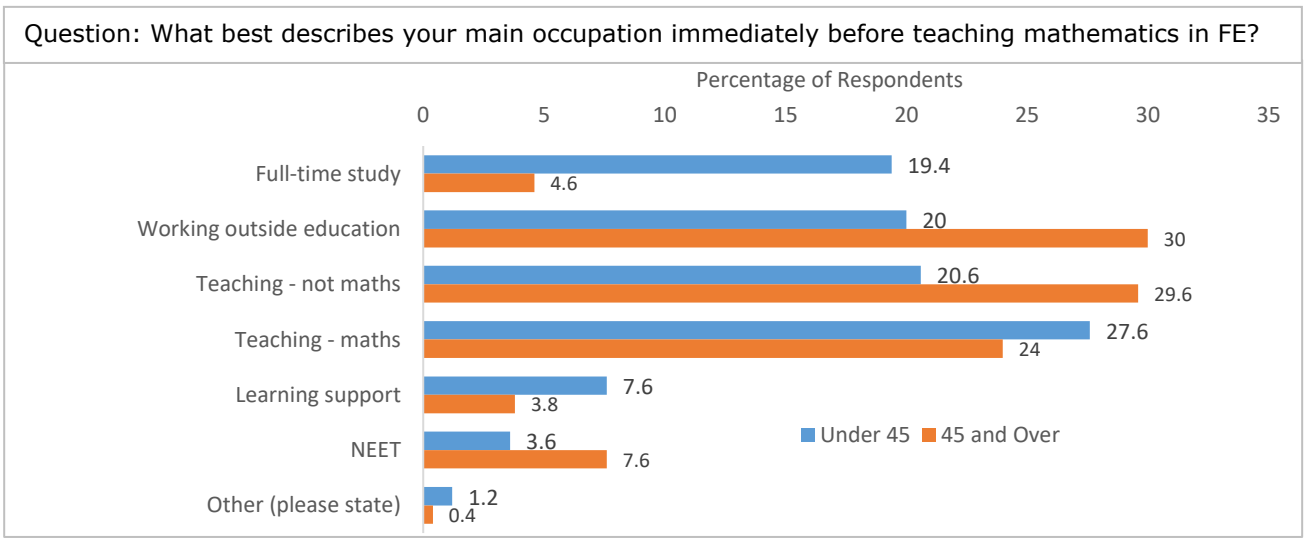
- *The significance of stability in a college's mathematics teacher workforce*. This affects teaching, strategic development and student learning. Many colleges have difficulty recruiting good mathematics teachers but those with effective strategies to achieve workforce stability see multiple benefits: collective approaches to planning are easier to develop; CPD has more sustained effects; students dislike staffing changes and value continuity.
- *The impact of 'whole college responsibility' approaches for mathematics.* These are reported widely but the extent of shared responsibility is variable. The active involvement of senior managers to invest time and financial support is important but so is the sharing of practical responsibilities with vocational staff, e.g. monitoring attendance, embedding maths in meaningful ways, linking vocational and maths learning.
- *Approaches to decision-making are variable and sometimes ill-informed*. There is a need for greater availability and wider use of sound evidence to inform decision-making at all levels in colleges. Appropriate and reliable data are not always available for managers to make well informed decisions. Choices made by teachers concerning resources or teaching approaches are also often made without sound evidence of their potential effectiveness.

What teachers are saying

Analyses of the data are on-going but the following selection of interim survey results, with comments based on related interview data, gives an indication of some of the interesting points. A full survey report will be published in the autumn on the project website.

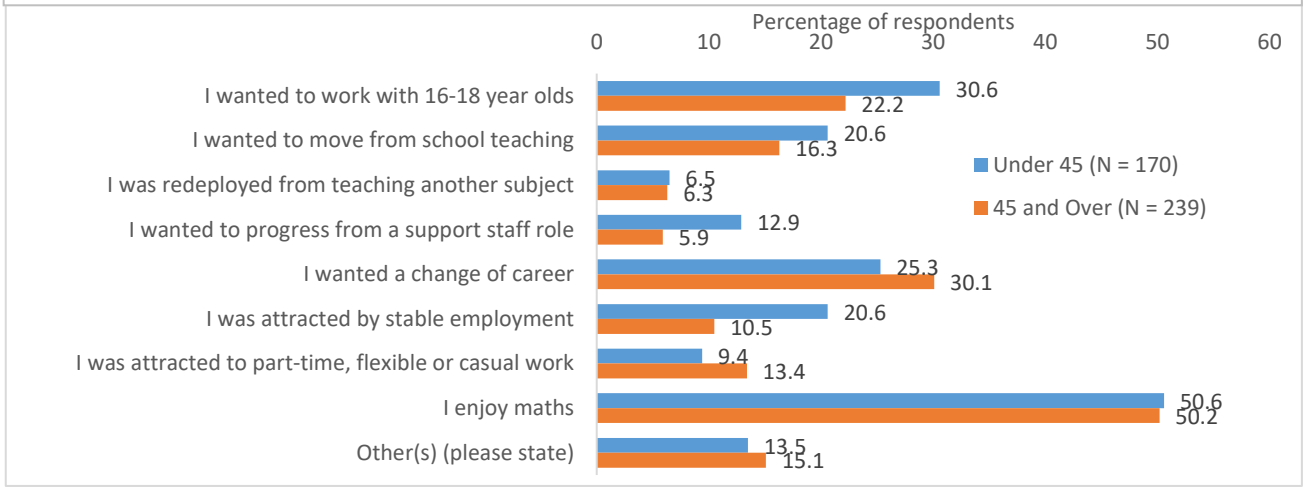


Most college managers reported difficulties in recruiting and/or retaining good mathematics teachers but reported levels of teacher satisfaction are encouraging. Pay and conditions (e.g. teaching disengaged students) are common reasons stated by managers for a transient and dissatisfied workforce but over half the survey respondents indicated they were either satisfied or very satisfied with their current roles.



Teachers were asked about their main occupations before becoming mathematics teachers in FE and their initial reasons for moving into this area of work. The age profile of our respondents suggests a division of results into two main groups of teachers (under 45, 45 and over). The older age group (45 and over) are more likely to have worked in industry, business or taught a different subject in FE prior to teaching mathematics in FE, whereas more of the younger age group have been in full time study. Interviews with teachers show very varied personal journeys into teaching mathematics in FE, rather than clearly established pathways. The diverse reasons for choosing to teach maths in FE are captured in the responses below.

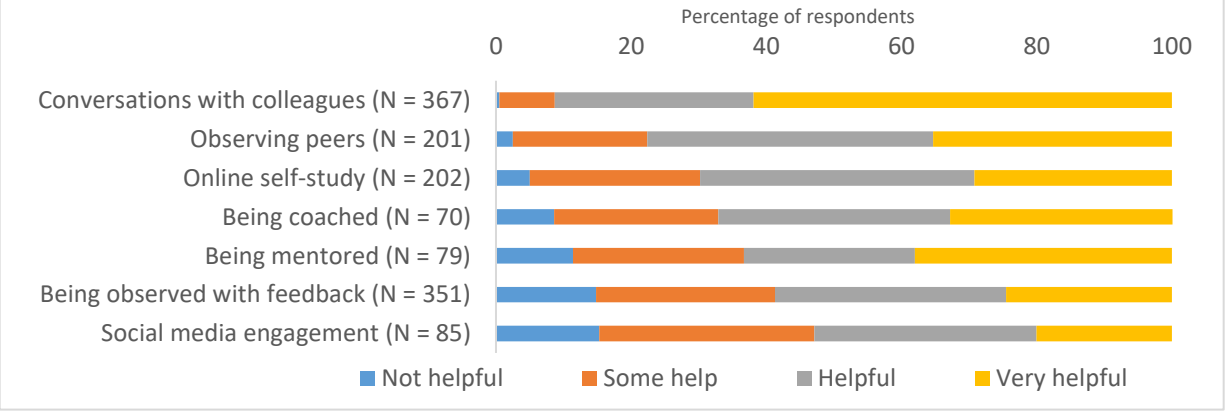
Question: What were your reasons for starting teaching mathematics in FE?



Notably, only half of the respondents included their own enjoyment of maths as a reason. Wanting a career change or to work with 16-18 year olds featured fairly strongly and, for some, FE was a preferred alternative to teaching maths in school. The reasons given in interviews by individuals indicate the diversity of circumstances and pathways that might lead to different combinations of reasons to teach in FE.

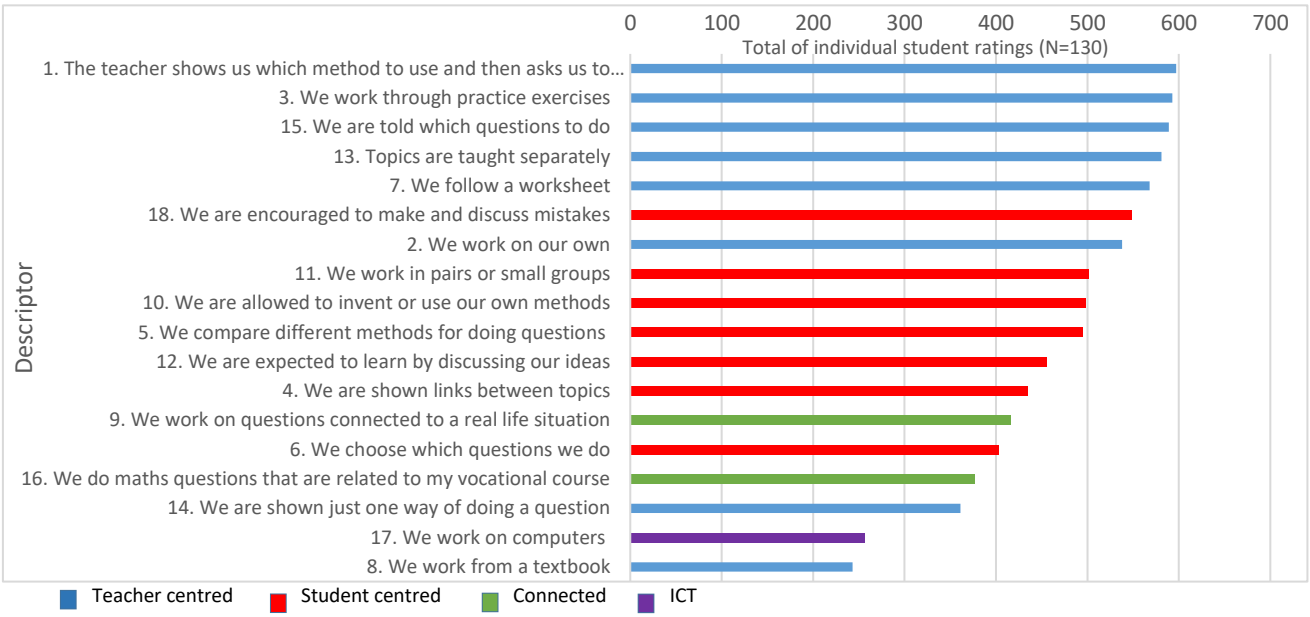
Teachers were asked in the survey about both formal CPD sessions and other opportunities for professional development. The value of informal interactions with colleagues was clear from both interview and survey data. Teachers reported that observing peers is more helpful than being observed.

Question: What [other] opportunities for CPD have you had this year and how helpful were they?



What students are saying

Student focus groups discussed their experiences of learning maths and used a card-sorting activity to describe their lessons. Many students stated that GCSE maths was important, either because it was the qualification employers wanted, or because they needed it for progression to HE. The usefulness of the actual maths was often questioned though. Many students expressed a dislike of maths, accompanied by a lack of enthusiasm to study it. Students' descriptions of lessons are summarized below.



The dominance of teacher-centred approaches contrasts with the stated intentions of many teachers to respond to students' individual needs and supports interview evidence of systemic barriers for teachers, such as time constraints, that influence their classroom practice. Specific 'connected' approaches (9 & 16) are often recognised as engaging for students but feature less strongly, along with the use of computers.

What is happening next?

Project plans for the next few months include:

- Further analysis of themes within the policy timeline to inform policy making and implementation;
- A full report on the mathematics teacher workforce survey (to be published mid-autumn);
- Completion of Next Steps survey analysis;
- Analysis of patterns of student progression with mathematics from ILR and NPD data;
- Further analysis of data from initial case studies and preparation for the second phase.

Early project findings have been presented at recent conferences (e.g. BSRLM, BCME, MEI and National Education Union, ALM/NANAMIC). The project team will continue to present findings at national conferences, in published briefings and in working papers. These presentations and progress updates can be found at https://www.nottingham.ac.uk/research/groups/crme/projects/mifec/index.aspx

Research team

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