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A survey of teachers of mathematics in England's Further Education Colleges

Executive summary

The Mathematics in Further Education Colleges Project

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Mathematics in Further Education Colleges – Interim Report (executive summary)
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Executive summary

The Smith Review of post-16 mathematics education (2017¹) highlighted the paucity of good data on the Further Education teacher workforce in England. Given the national policy priority of raising the level of mathematical competence throughout education and in the general populace, and the central role that Further Education (FE) plays in realising this ambition, this is a serious shortcoming.

This survey is the most comprehensive evidence of the mathematics teacher workforce in England's Further Education colleges (FEC) at the present time. Key stakeholders need to understand the composition of this workforce and, in particular, how it differs from that of secondary schools. This will enable better strategic design of policy and practice for the recruitment and initial training of suitably-qualified teachers in FE and the ongoing professional development of established teachers of mathematics.

The survey is one strand of the Mathematics in Further Education Colleges (MiFEC) project and is funded by the Nuffield Foundation. The project includes a major ongoing programme of research in colleges so there are no substantive recommendations at this stage. The final MiFEC report (due late summer 2019) will combine the project's strands and include recommendations for a range of stakeholders including national decision makers, college managers, curriculum leaders and CPD providers.

The MiFEC survey was designed to answer two of the project's main questions:

1. Who is teaching post-16 mathematics in Further Education (FE) colleges and what are their roles and responsibilities?
2. What are the training and development needs of these teachers?

In addition, the survey provides rich data relevant to a wider range of issues concerning the FE mathematics teacher workforce at a time of transition.

This MiFEC survey focuses on General Further Education Colleges (GFECs) and does not include Sixth Form Colleges (SFCs) or other FE providers. Hayward and Homer's (2015) survey² included SFCs and only had a small number of mathematics teachers from GFECs across England. The recent Department for Education (DfE) survey conducted in 2018 is general in nature and so cannot answer the mathematics-specific questions above. Similarly, FE workforce reports based on Staff Individualised Record (SIR) data are not sufficiently granular. The data reported here, therefore, offer the clearest and most up-to-date account of the mathematics teacher workforce in FE in England.

The sample for the survey consists of teachers of mathematics qualifications (of any age group or level) from 31 Further Education college providers (i.e. FE colleges or college groups) who agreed to participate in the MiFEC project. This is around one sixth of all such providers in England. The selection of these 31 providers from the 187 GFECs at the commencement of the project (Sept 2017) was designed to provide a balanced sample across the nine regions of England through stratification by region and use of a limited

¹ Smith, A. (2017). Report of Professor Sir Adrian Smith's review of post-16 mathematics. London: Department for Education. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630488/AS_review_report.pdf

² Hayward, G. & Homer, M. S. (2015). Profile of the mathematics teaching workforce in the college sector in England. London: The Gatsby Charitable Foundation.

number of selection criteria: size (number of 16-18s); type of provision (vocational only or academic and vocational); location (e.g. *urban major* or *minor conurbation*); mathematics progress measure and most recent Ofsted grade. Carrying out the survey with this balanced sample of colleges provides opportunities for integrating the case study and survey data. There is also good potential for generalization and data triangulation. The response rate is estimated to be just over 60% based on unofficial workforce data provided by these colleges. The survey was conducted in the summer of 2018 with 480 teacher respondents.

Key findings

The main findings fall into three broad areas: 1) the composition of the mathematics teacher workforce, 2) training and professional development needs, and 3) roles and responsibilities.

Composition of the workforce

The composition of the mathematics teacher workforce in FE colleges is distinctive with respect to teachers' prior experience and entry routes. It is important that decision makers understand this distinctiveness as it has a bearing on recruitment, training and ongoing professional development.

The *backgrounds and prior occupations* of FE mathematics teachers are diverse. Teaching mathematics in FE frequently follows a career change with teachers transitioning from a range of occupations. The most common prior employment for FE mathematics teachers is working in industry, business or self-employment. Other common entry routes involve a transition from vocational (or other subject) FE teaching or from teaching mathematics in schools. Very few are in full-time study immediately prior to teaching mathematics in FE (10%). The range of prior occupations and entry routes differs from the typical route into school mathematics teaching, i.e. as a first career. The FE mathematics teacher workforce broadly consists of those who have entered via three main pathways:

1. those changing career from outside education to teach mathematics in FE (24%);
2. those with experience of teaching in FE who have changed subject or added mathematics as a second subject (19%);
3. those who have taught mathematics elsewhere before moving into FE (23%).

Contractual arrangements (e.g. full-time or part-time) and timetabled teaching for this sample of teachers shows the majority (63%) specialising in mathematics teaching (i.e. teaching mathematics only) but around a quarter (26%) are teaching another subject as well as mathematics. Most of those specialising in mathematics teaching are on full-time contracts. Those teaching another subject as well as mathematics may teach mainly mathematics (10%) or be employed as vocational (or other subject) teachers but teach some mathematics as a second subject (16%). A substantial contribution to the workforce (26%) is made by these teachers who have dual priorities. A staff audit carried out by each college shows slightly less full-time mathematics specialists and slightly more hourly paid teachers than in this sample but the overall contractual profile is similar.

Teaching mathematics in FE is an attractive *career change or progression* for both younger and older people from a range of backgrounds. Teachers enter FE mathematics teaching for a variety of reasons, often based on a personal preference or choice. Common reasons

to teach mathematics in FE include wanting to work with 16-18 year olds (25%) or to move away from teaching in school (17%), as well as having a personal enjoyment of the subject (49%). This diversity is important when considering ways of attracting more mathematics teachers into FE.

There is evidence of some short-term *workforce stability* since the majority of respondents expect to continue in a similar role for the coming year and job satisfaction levels are reasonably good (60% satisfied or very satisfied). The medium to long term prospects are less certain. In three years' time 15% of the current workforce expect to have moved out of FE mathematics teaching and over a fifth are undecided about their future plans, whilst new entrants to the profession have only amounted to 18% of the workforce in the last three years. It is likely that the mathematics teacher shortage in FE will increase unless there is a downturn in demand or significant interventions to boost recruitment.

Training and professional development

There are varied and substantial training and professional development needs within the mathematics teacher workforce that result from the diversity in qualifications and prior experience. These need addressing either within initial or pre-service training or in appropriate professional development pathways for individuals.

Almost all of the respondents have undertaken a *teaching qualification* or are currently in training. Much of the workforce has experience of teaching mathematics and/or teaching in FE but just under half (45%) do not hold a *specific mathematics (or numeracy) teaching qualification*. This highlights the need for developing teachers' subject-specific pedagogy, in particular for those new to FE mathematics teaching or experienced vocational (or other subject) teachers who have made a transition into teaching mathematics.

Teachers have varied levels of *qualifications in mathematics*. Some have undergraduate mathematics degrees (30%) or a Master's degree (7%) whilst others only hold a Level 2 qualification (34%). Some of the FE mathematics teacher workforce are teaching at the same level as their highest qualification in mathematics. Although some teachers have additional non-accredited subject knowledge, there is an outstanding need for subject knowledge enhancement in professional development plans.

Most teachers of mathematics in FE experience very little *mathematics-specific Continuing Professional Development (CPD)* (55% reported 5 hours or less³, one sixth reported 0 hours). The number of hours per year varies widely (19% report over 20 hours), even for those teaching mathematics as their main subject, and there are striking differences between colleges. Whilst teachers in one college report having very few mathematics-specific CPD sessions (e.g. 0-5 hours for 86%), staff in another college report that they attend the equivalent of several days per year (e.g. 80% over 20 hours). Those who teach another subject in conjunction with mathematics are less likely to participate in mathematics-specific CPD, although these teachers may have substantial training needs. Given the priority of increasing post-16 mathematics attainment and the diverse needs of the workforce, the support for mathematics-specific CPD is low.

Teachers value opportunities for *informal professional development*, particularly discussion with colleagues (92% helpful/very helpful). Coaching or mentoring activities are also

³ This and other CPD numbers in this section are for the academic year 2017/18.

considered helpful by around 90% of respondents and they report benefitting more from observing their peers than being observed. The diversity of the teacher workforce provides a rich, and often untapped, resource for this type of informal professional development.

Roles and responsibilities

The roles and responsibilities of mathematics teachers in FE reflect *current priorities in the implementation of post-16 mathematics policy*. There is some specialisation in teaching roles according to the qualifications being taught but, in general, all teachers undertake a range of out-of-class activities including administrative tasks and those directly connected to classroom teaching and support for students.

The majority of mathematics teachers in general FE are teaching *qualifications at Level 2 and below*, reflecting the prioritisation of 16-18 low-attaining students in current policy and the impact of the *condition of funding*. Around two thirds teach GCSE Mathematics (63%) and Functional Skills Mathematics (65%). Some currently specialise in being either a GCSE (25%) or Functional Skills teacher (24%), although another quarter of respondents teach both qualifications (24%). A minority teach A level Mathematics (7%) and Core Maths (4%), usually in conjunction with other mathematics qualifications. A larger minority teach on a range of accredited and non-accredited 'other mathematics' courses (11%).

Out-of-class tasks take up a considerable amount of time for many FE mathematics teachers (c. 12-14 hours). Most time is spent on assessment, planning and preparation but tracking student progress and monitoring attendance also feature strongly. The range of activities carried out shows the importance of things that are directly linked to ensuring *student compliance* with compulsory mathematics policies, for example attendance monitoring (23% report spending 2-5 on this per week).

Most FE mathematics teachers spend some time *liaising with vocational staff*. This is more likely to be about students than about mathematics. Whilst this indicates a high level of interaction concerning student welfare and behaviour, there is less communication about connecting mathematics to vocational learning (69% report 20 minutes or less per week). Most teachers provide *voluntary support for students*, on an individual basis or through a workshop. In some colleges, workshop teaching is part of teachers' contracted teaching hours but in others it is voluntary and additional.

The most common *professional development needs* identified by teachers are connected to issues with a) student engagement, motivation and behaviour and b) subject-specific approaches to teaching. The emphasis on improving student engagement, motivation and behaviour arises from compulsory mathematics policies. Teachers' perceptions of needing to increase their understanding of mathematics-specific pedagogy are consistent with the CPD needs identified above and highlight the importance of an appropriate professional development programme planned to address the specific individual needs of mathematics teachers.