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Academy for the Mathematical Sciences:  
Spring/Summer 2023 Consultation

# **Executive Committee's Response to the Consultation Feedback**

December 2023

## Executive Committee response to the consultation feedback

We, the Executive Committee, appreciate the considered responses that members of the mathematical sciences community provided during the consultation exercise. This was an important opportunity to seek input from the community and we have carefully considered the responses. The input is extremely valuable as we finalise the strategic and operational plans for establishing a new national Academy for the Mathematical Sciences (AcadMathSci), and begin pilot operations during the set-up phase (e.g. the newly formed Policy Unit).

Overall, there was widespread backing for the establishment of an Academy and support for the overall vision and proposals outlined in the consultation document. There was also agreement that this was a timely and important initiative, and the Academy's collaborative approach and emphasis on building a cohesive and inclusive community was widely liked. Across all themes, there was a strong desire for all members of the community to be allowed the opportunity for meaningful involvement. The responses received conveyed a welcome diversity of opinions on various matters, discussed in detail in some of the later sections below. Overall, this provided reassurance that we really have received a good cross-section of the views of the mathematical community. The Executive Committee appreciate the detailed report and executive summary of these responses prepared by Jo Jordan, which we have published on the AcadMathSci website.

Additionally, workstream leads have consulted with Advisory Board members in more detail on responses aligned with their specific workstreams and reported their findings to Executive Committee, which we summarize below for each of the following themes:

1. Governance
2. Fellowship
3. Policy
4. Advocacy
5. Communication
6. Education
7. Implementation of Mathematical Sciences
8. Equity, Diversity & Inclusion (ED&I)
9. Early Career Mathematical Scientists
10. Academies & Societies
11. Development & Finance

### **1. Governance**

Some practical issues were raised regarding the plan for charitable status, all of which were taken into account before we submitted our (successful) application to the Charity Commission to register as a Charitable Incorporated Organisation (CIO).

On the proposed structure, most respondents were supportive, whilst rightly noting that it was hard to tell without more information on exactly how things will operate. Respondents flagged up a number of important issues which we will bear in mind as we design the structures and processes:

- The Fellows and Trustees must be sufficiently diverse;
- All members of the mathematical sciences community, not just Fellows, should be meaningfully involved;

- It is important to build a collegial culture and watertight constitution to enable the overthrow of any emerging tyrants;
- The Board should consist of people with knowledge of governance and Board-level processes, rather than ‘maths grandees’; and
- The need to address the challenge of aligning all the different interests of those involved.

A small minority (fewer than 5 respondents) believed that the governance proposal constituted an undemocratic and closed structure. This view was not shared by the majority of those who responded, and we too were not persuaded. As plans develop we will, of course, seek to ensure democratic and transparent structures are in place.

## **2. Fellowship**

Although the majority of respondents either positively welcomed or indicated neutrality towards the Fellowship model, one quarter were either sceptical that it would deliver what was wanted, doubtful about some of the details, or (in 11 cases) unequivocally opposed. We recognise this split in the community, since it has been mirrored in the discussions held at Executive Committee. We continue to believe that the model being pursued is the one most likely to help us deliver the aims of the Academy, but recognise the downsides and risks, and acknowledge that some in the community do not approve or support this approach.

Whether supportive, sceptical or doubtful, many respondents were concerned about the risks of elitism, exclusion, divisiveness, lack of diversity, and replication of existing power structures; and about the importance of recognising that ‘excellence’ goes beyond the quality of mathematical sciences research or output to include a variety of other characteristics, behaviours and achievements. We accept the importance of addressing all these issues as we go ahead with designing Fellowship criteria and processes.

We are grateful for the many useful practical suggestions we received in response to the questions on how to define excellence (28 suggestions), ensure equity, diversity and inclusion (27), and set criteria (21); as well as several reservations and wise warnings. These suggestions are being taken up alongside other work, learning from other Academies and exploring options, in an iterative process to define a Fellowship that will:

- Be open and diverse;
- Command the respect of peers and stakeholders; and
- Feel enabled to contribute towards the goal of supporting the flourishing of the mathematical sciences and their impact.

It will not be possible for all suggestions to be taken up, indeed some are directly opposed to one other (for example, on the balance of seniority and experience, or quotas). However, we expect that most will be addressed by the final Fellowship model.

## **3. Policy**

Many respondents emphasised that Academy Policy should be evidence-driven. Several expressed a further wish for the Policy Unit to focus not just on building an evidence base (which could be both quantitative and qualitative, e.g. case studies for the latter), but crucially to enable advocacy for the Academy Policies developed.

In terms of prioritisation, a strong majority viewed the “people pipeline” (including school-level education, teacher supply and retention and higher education) as the highest priority. There was broad support for all other proposed activities:

- Convening and brokering relationships;
- Building the evidence base and responding to calls for evidence; and
- Quantifying the value of mathematical sciences to the UK.

Other possible suggested foci included (in order of the most frequently mentioned):

- Public perceptions and understanding of the mathematical sciences, especially concerning the tangible benefits of mathematical sciences to society;
- Developing direct links with government policy makers;
- Being reactive on policy issues when needed;
- Business and industry engagement;
- Emerging technologies such as AI;
- Speculative research and mathematics for its own sake;
- Improving ED&I and access to the mathematical sciences;
- Lobbying for better funding; and
- Adult education, upskilling and training.

In the work to date on policy and advocacy the Academy has drawn a distinction between ‘maths for policy’ and ‘policy for maths’. The balance between these activities may indeed vary over time; there is a desire to ensure there is a clear process for establishing the ongoing balance of policy and advocacy. The suggestions and priorities indicated are being directly integrated into the planned programme of work for the Policy Unit.

#### **4. Advocacy**

Respondents on the whole agreed that the Academy should play an important role in advocacy. Interestingly, some respondents suggested the advocacy plans were not sufficiently ambitious; which perhaps reflects the current priorities: to make the Academy attractive across the entire mathematical sciences community and to secure its funding. Bolder plans for advocacy may risk alienating some in the community, however the Academy aims to provide a platform where open dialogue will support, and not inhibit, ambition.

Several respondents highlighted that it was important not only for the Academy to ‘do advocacy’ but to do it well. This includes ensuring that:

- There is a clear process for surfacing and prioritising the key concerns of the community;
- There is transparency over who makes decisions;
- The Academy represents the learned and professional societies and is not just an additional voice;
- Advocacy efforts should align with the broader needs and interests of society; and
- The Academy is empowered with the independence to criticise.

Concerns were raised regarding the importance of the Academy’s engagement with some issues which didn’t fit the proposed tests (outlined in the consultation document). For example: longer term issues for which the mathematical sciences could provide unique input, but are not currently important, and big issues specifically facing the mathematical sciences community. The ‘added value’ test was identified as particularly important, including asking the useful question – ‘is the impact measurable?’

## 5. Communication

A wide range of communication channels were suggested by respondents. We recognise the importance of multiple channels to engage different audiences, and the value in using trusted channels such as networks in learned and professional societies and university departmental representatives. We were also pleased to see there is an appetite for regular newsletters/emails, and various printed materials for both internal and external use. Whilst recognising that communication channels evolve over time, we were pleased to note LinkedIn as a preferred social media channel among the respondents. This provides confidence for increasing and amplifying communications via LinkedIn.

Enthusiasm for in-person networking and generating case studies to promote the Mathematical Sciences were also appreciated. We do however recognise that the number of respondents to the consultation only represents a small sample of the Mathematical Sciences community, so the Academy should prioritise identifying effective mechanisms to communicate and engage with the whole community.

## 6. Education

A majority of respondents agreed with our initial priorities:

- Securing adequate recruitment, supply and retention of knowledgeable and effective teachers;
- Ensuring the coherence of the mathematical sciences/stats/data across the curriculum and providing support for teachers across other school subjects in both secondary and primary schools;
- Designing a coherent policy to reverse the perception that a mathematical sciences degree is a viable option only for students with top grades; and
- Developing a well-designed communication strategy that addresses the negative attitude of the populace to mathematics.

We agree with respondents who argued for the importance of long-term strategies rather than attempting quick fixes.

Concern was raised about how the Academy would interact with Joint Mathematical Council (JMC), which is already seen to be working effectively in this space. JMC is a charity and is limited in that it has to seek funds for any research or survey work it wishes to carry out. However, it does bring together all the voluntary associations, membership and otherwise, plus key players in the commercial market such as ARK, so there is a long-standing understanding and loyalty to the cause. We are working closely with JMC and the JMC chair, Prof Andrew Noyes, is a member of the education workstream, and we are grateful for his and their support. We also strongly agree with respondents on the need to work in partnership with institutions such as National Numeracy, Maths4Girls and Founders4Schools to explore the factors that make other countries more successful at selling maths. We also support the suggestion to bring in communications experts to help us design effective promotional campaigns.

We appreciated ideas and suggestions from respondents on the topics of teacher supply and curriculum coherence. Suggestions were made for adding in real-world applications to improve curriculum coherence and to make the school curriculum more enjoyable. In Higher Education, a national policy to ensure fair geographical coverage was raised as a possible topic for the Academy policy unit. We noted the suggestion to replace the phrase 'negative attitude ... to mathematics' (from our initial priorities) with a more positive aim of 'increasing the overall level of numeracy skills', whilst recognising we wish to address negative attitudes to maths more broadly than just numeracy.

## **7. Implementation of Mathematical Sciences**

We acknowledge and share the view of many respondents that engaging business, industry and government (BIG) in mathematical sciences is difficult.

The respondents offered some very useful suggestions to enhance visibility and engagement. A clear statement of the Academy's added value is vital, and this should be communicated in accessible language using a variety of different media (popular press, social media, communications from learned and professional societies and other relevant bodies). Promotion of success stories was seen as being particularly effective. There was also a clear message that in-person events were necessary for effective implementation and that these should be held across the UK.

One respondent pointed out that mathematicians working in industry don't necessarily identify themselves with 'the practice sector' or as 'practitioners', although many other respondents used these terms to categorise those working outside academia and education. The choice of inclusive language is important and will continue to be an area of focus for the Implementation workstream.

Another important strand was collaboration between the academy and existing bodies, particularly the non-academic facing sections of learned and professional societies, but also trade organisations such as the British Chambers of Commerce and Catapult Network. There are pockets of excellent engagement within mathematical sciences which provide good examples to emulate.

The Knowledge Exchange Hub and the Academy are working closely together to support knowledge exchange activities across the mathematical sciences. The academy will provide the opportunity for developing networks that include those working in BIG, education and academia.

## **8. Equity, Diversity & Inclusion**

We are pleased by the strongly positive feedback and appreciate the constructive critique expressed by respondents, which helps us maintain a rigorous approach and embrace diversity of thought. Positions and actions that we take as a community must be respectful of all members of that community.

The responses show strong engagement and support for our ED&I trajectory. There was very clear acknowledgment of persistent misconceptions and stereotypes hindering participation in the mathematical sciences, and the need for action. At the same time, there is concern about politicising ED&I and excluding those with more conservative views. An emphasis on work to include groups traditionally underrepresented in the mathematical sciences, and to redress the historic disadvantages these groups face in our community, is not and should not be put at odds with ensuring all members of the community feel a sense of belonging.

In response to the consultations, we would like to affirm the following principles:

- Mathematical sciences are at the heart of the Academy, and therefore so are mathematicians and mathematical scientists. The flourishing of mathematical sciences disciplines cannot happen unless we address underrepresentation and embrace talents in all areas. Equity, diversity, and inclusion are therefore core values of the Academy, recognising that various social and economic barriers exist to entering, progressing, and remaining in the mathematical sciences. Overcoming these barriers is crucial for the generation, dissemination, and utilisation of mathematical knowledge.
- There are topics of importance to the Academy about which there is substantial and sometimes contentious disagreement. We are committed to addressing these topics openly and fostering the exchange of ideas through lively discussions. Our goal is to find a way forward, recognising

the considerable number of areas where we share agreement and common interests as a solid foundation for these discussions.

- Whilst the mathematical sciences rely heavily on evidence and stringent requirements, we also recognise that the mathematical sciences community is a social phenomenon. Therefore, the appropriate forms of evidence for studying, understanding, and creating policies in communities can differ. We will follow a data- and evidence-based approach – as has been in the case so far in the ED&I activities of our learned and professional societies– however, there may be instances where we will need to make decisions under uncertainty due to inadequate evidence. We commit to ongoing evaluation of and improvement in our policies and practices in this important area.
- Within the framework of the Equality Act 2010, we will also consider socio-economic background, class, and diversity of thought, as well as the combination of various protected characteristics (“intersectionality”). The Academy will challenge the status quo and focus on removing barriers for underrepresented groups. We will do so respecting diversity and by acting as an ally and a supporter of our underrepresented communities.

## **9. Early Career Mathematical Scientists**

We thank the respondents to the consultation for their clear direction and insightful suggestions, and we agree with respondents that the Academy should reach out to, recognise, and represent the full Early Career community.

There was broad consensus about the top priorities for the Academy relating to Early Career Mathematical Scientists, which will inform the design of our initial programmes and activities. Respondents indicated strong support for:

- Cross-community career development, including Continuing Professional Development;
- Building on existing activities within learned and professional societies, rather than duplicating existing activities, and building links with universities;
- Funding to ensure that the full Early Career community can participate in activities; and
- Activities that grow and support a diverse and inclusive Early Career community.

## **10. Academies & Societies**

The Academies and Societies Workstream is very grateful for the contributors to the consultation. We agree that there are two rather separate missions:

1. External relations with other learned and professional societies and academies; and
2. Concerns relating to mathematical sciences in universities.

In light of this distinction, there may later be a division of the workstream into two. We welcome the notions of closer integration of university level teaching of mathematical sciences and teacher training, and bringing together academic and practitioner communities. Another suggestion is that the Academy should identify and support cross cutting themes such as the History of Mathematics.

More broadly, the consultation clarified the importance of the mathematical sciences being represented by a single voice, but acknowledging areas of well-founded divergence. To facilitate this, it will be important to ensure close working relationships with the existing member societies of the Council for Mathematical Sciences, and with other groupings in the mathematical sciences landscape and beyond. Defining these relationships is an important step in the next stage of our work. A key

aim will be to preserve and support the autonomy of other Societies, and of the Academy itself, so we do not think it appropriate for there to be cross-nominations to governance roles, but rather to develop joint working in other ways, both through appropriate formal channels and through natural overlaps in the Fellowship.

We agree it is important to identify and address gaps, but believe we can go beyond this; augmenting, coordinating and supporting learned and professional societies to achieve and expand their own goals and those of the community. We are delighted that the notion of working synergistically with others gained very strong (although not unanimous) support; in moving forward the Academy will take on board the need to continue explaining its achievements and intentions to interested parties.

## **11. Development & Finance**

Almost all of the comments relating to Development and Finance were in agreement with the proposal outlined to fund and organise the Academy. A minority of respondents suggested the proposed funding totals exceeded their expectations.

Some additional suggestions from respondents, with which we agree, are as follows:

- The requirement for an ethical donor policy;
- The need to clearly articulate the benefits of the Academy;
- Consideration of an endowment; and
- Exploration of all sources of funding.