Strathclyde Response

Section 1: Initial research pooling initiative

Q1a. What has been the impact of the initial research pooling initiative?

Strathclyde has been a committed participant in the SFC-funded Research Pooling initiatives since these began in 2003. We have a critical role in both the Scottish Research Partnership in Engineering (SRPE) and the Energy Technology Partnership (ETP) where our Principal Professor Sir Jim McDonald is Chair. We play leading roles in SUPA (Physics), ScotCHEM (through WestCHEM, chemistry) and we are engaged at appropriate levels in all the other Research Pools relevant to our work including MASTS, SICSA, SIRE and SULSA. Strathclyde was also an active member of the HealthQWEST pool. The SRPE and Energy Technology Partnership (ETP) are headquartered at Strathclyde, as is the ETP KE Network.

The initial SFC research pooling initiative precipitated an assessment/ audit of the disciplinary strengths of the Scottish HEI Sector which preceded (by several years) exercises such as the EPSRC's "Balancing Capability" initiative and the BEIS Science & Innovation Audits. SFC's pooling initiative also incentivised the HEI Sector in Scotland to start thinking about the benefits, in terms of national and international competitiveness, of working together in selected disciplines where there was the potential to grow capability and capacity, and to generate a critical mass of internationally-leading research.

The pooling initiative built on existing inter-institutional collaborations in some cases, but in other cases it stimulated dialogue between Scottish universities in disciplinary areas which has been very important – not just in terms of the direct impact of the initial research pools – but in terms of creating a more open and trusting relationship between universities, and a more collaborative culture. The culture that pooling created has served the Scottish HEI Sector well in terms of success in addressing major competitively won collaborative research investments (including in research facilities) which would not have been so easily achieved in the absence of pre-existing relationships. Selected examples include, (i) through SUPA an outstanding level of success with prestigious European Research Council awards with 36 personal awards each of value > € 1M; (ii) through WestCHEM the £4.4M UK Science & Innovation Award in Physical Organic Chemistry, (iii) through SULSA the Scottish Sector has recently won strategic investment in several internationally-recognised facilities such as the £5M Scottish Consortium for Macromolecular Imaging "CryoEM" facility (Glasgow) and the £1.4M Scottish High-Field NMR facility (Edinburgh).

Most of the pools with which Strathclyde has been involved can also point to tangible benefits in terms of recruiting and retaining research leaders of international standing, improved research quality as determined by successive RAE/REF outcomes, and improved attractiveness to prospective research students compared to the "pre-pools" era. These statements are particularly true of our experiences with SRPE, WestCHEM and SUPA. SUPA in particular has cited its ability to attract top researchers into academic posts despite cut-throat global competition and asserted that the value of the SUPA Graduate School; encouragement to collaborate across SUPA partners; sharing of equipment and facilities, were all positive attractors for outstanding researchers to move to Scotland. SUPA quoted an independent assessment from the REF2014 Main Panel B Overview Report "There was increasing evidence for pooling of resources in regional groupings, as pioneered during the period of RAE2008 by the Scottish Universities Physics Alliance (SUPA). SUPA has gone from strength to strength during the REF20014 assessment period…".

We consider that the cultural impacts that resulted from the experience of collaboration and shared planning across the sector in some disciplines have probably been more important that the legacy of specific pools in most cases. This is especially true with the advent of UKRI and the establishment of major long-term strategic funding sources such as Industrial Strategy Challenge Fund (ISCF) and Global Challenges Research Fund (GCRF).

Related to the above point, and an issue that is addressed in more detail in our answer to Question 1B, ***the creation via the pooling initiatives of a culture of collaborative, multi-institution cohort-based PGR Training environments / Graduate Schools has allowed Scottish institutions to have success in winning and delivering e.g. Research Council Centres for Doctoral Training, that may not otherwise have been achieved and in attracting high quality research students to the pools.*** Examples include (i) EastCHEM providing the basis for winning the EPSRC Centre for Doctoral Training in Critical Resource Catalysis (CRITICAT); (ii) ETP providing a basis for the EPSRC Centre for Doctoral Training in Wind and Marine Energy Systems; (iii) MASTS recently winning a £5M NERC DTP, via the Scottish Universities Partnership for Environmental Research (SUPER) consortium with academic supervisors from most of the 17 MASTS partners.

When reflecting in 2019 upon the initial pools, we observe that all of the pools had a noticeable visibility in the first 5-10 years of pooling but that, for example there were less joint REF submissions from the pools in 2014 than was the case in RAE2008. This could be interpreted as indicating that the HEI Sector in Scotland has perhaps matured in terms of its ability to collaborate for mutual strategic benefit at the same time as re-setting the perceived need to collaborate on formal research management/ governance.

We also observe that, perhaps at odds with the initial vision of pooling as strengthening the competitiveness of disciplines, two of the pools which have sustained best in terms of their visibility and impact are the Energy Technology Partnership and MASTS. Both of these pools are inherently multi- and inter-disciplinary – and, of course, as noted above, the trend in UK funding sources has moved increasingly towards major strategic investments (via UKRI/ ISCF/ GCRF etc) that are often long-term, place- or sector-focused and multi-disciplinary in nature. ETP and MASTS have also provided a strong supportive platform for the SFC Innovation Centres and several of the UK Catapult investments – for example ETP was heavily involved in scoping and advising on the creation of the Oil & Gas Innovation Centre ("OGIC") and has formal partnerships with the UK Catapults in Wave Energy Systems, Energy Systems and Offshore Renewable Energy. SUPA's collaborative ethos was also significant in the creation of new physics-based, industry-facing institutes which are now Associate Members of SUPA; e.g. the UK Fraunhofer Centre for Applied Photonics and Fraunhofer UK Research Ltd, both based at Strathclyde. The Scottish Research Partnership in Engineering (SRPe) has led many different initiatives increasing research funding into Scotland and is currently operating as a core delivery partner in the Scottish Government's National Manufacturing Institute for Scotland, focussing particularly on skills provision through industrial doctorates and CPD. ***We see the success of the cross-discipline pools like ETP and MASTS, and the SUPA and SRPe discipline-specific pools, in engagement with the translation/ innovation agenda as perhaps indicative of the way that the impact of pooling has adjusted in the years since it started, and the important part that the successful pools now play in the emerging UK agenda of "Place" in the context of Industrial Strategy and Innovation***.

Q1b. What lessons can be learnt from the research pooling initiative?

The best examples of Research Pooling have embodied the Scottish sector's collegiality, turning our geography and openness to collaboration into an advantage by pooling to create a critical mass. Each pooling arrangement has had its own unique leadership, structure and trajectory and therefore it is important to consider the range of ways in which the individual pools, as well as the overall pooling initiative, have delivered, and are continuing to deliver, on the original objectives.

As noted above ***the impacts of pooling have, in our opinion, been most acutely felt in terms of culture change which in turn has positioned the Scottish HEI Sector to be competitive in a different international research (and research funding) landscape***.

Key lessons that we would contend should be learned from the research pooling initiative to date include:

- ***The importance of visionary leadership*** for each pool, at pool, institution and, importantly, funding agency level in order that the long-term benefits of pooling are realised in practice. We observe that the pools which have sustained in terms of relevance and profile all have had one or more visionary academic leaders and the communities have continuously engaged with the evolving research and innovation landscape at Scottish, UK and European level;

- ***The value of pan-Scottish PGR training environments/ Graduate Schools and other cohort-based PGR experiences*** that resulted from the pools. As well as helping to develop a culture of large, cohort-based PGR Training environments involving industry and other end users of research, Graduate Schools and the like have provided a "reality" to several of the pools beyond the initial phase and this in turn underpins many of the other research successes achieved in collaboration by members of each pool.

  The PGR Training environments/ Graduate Schools associated with the pools have also directly delivered step change impacts. By way of examples, (i) the SUPA Graduate School remains the highest priority ongoing activity within SUPA. It offers over 50 specialist (PhD level) courses (over 800 hours of lectures) to the largest cohort of physics PhD students in the UK (over 600 registered) using a dedicated, interactive video classroom network in the 8 HEI partners, as well as proving professional development training for students and PDRAs by face-to-face, VC and distance courses. This provides significant competitive advantage to Scotland in attracting the best PhD students; (ii) the MASTS Graduate School which includes the embedding of a PG Cert in Researcher Professional Development for all participants in addition to core PhD studies (the PG Cert is administered through Strathclyde); and (iii) the ETP's Energy Industry Doctorate Programme which has created and supported 107 PhDs, each of whom is co-supervised by an academic and an industry supervisor. Strathclyde is highly committed to the extension of cohort-based PGR environments involving intensive engagement with outside organisations (industry, public sector and other "users" of research) such as those supported by the EPSRC's Centres of Doctoral Training Competition and the experience from pools should always be factored into the planning of CDT-type initiatives.

- The value of pooling in ***achieving an inclusive environment within which smaller HEIs and more specialist institutions can bring their pockets of excellent research capability into larger (funded) collaborative endeavour, and gain the benefits in terms of research environment, research outputs and impact that participation can deliver.***

- ***The importance of adopting governance arrangements that are appropriate to the goals of each pool and the avoidance of a one-size fits all approach to governance and structural issues.*** For example MASTS, which now includes 17 HEIs and research organisations, has a strong and dedicated MASTS Directorate, supported by an Executive Committee and separate MASTS Board and MASTS Advisory Committee, but is not constituted as a separate legal entity.

- On a more cautious note, the creation of entities, super-structures and new governance bodies that initially accompanied some of the pools could be seen as an expensive overhead that did not add much long-term value when compared with the positive changes in behaviour and culture and impact that we have already cited.

Section 2: Pooling now and in the future

Q2a. In the current research landscape, what is the perception of, and role for, the pools?

As noted elsewhere in this response the UK research funding landscape has changed dramatically in recent years with an increasing focus on large, long-term strategic investments associated with the UK Industrial Strategy and/or Global Challenges.

The collaborative relationships and cultural shifts that have been created as a result of research pooling have positioned Scottish HEI sector in a good place to address the current funding landscape.

While not all of the pools have sustained as "brands" we consider that the pools – and more importantly the relationships and collaborative behaviours that they have embedded – provide an excellent mechanism in some cases for sector-wide engagement with industry and other organisations such as the Innovation Centres/ Catapults etc.

Q2b. Should research pools have a continuing role in the Scottish research base?

Our opinion is that ***research pools should have a continuing role in the Scottish research base***, because the factors which pertained at the time of the original initiative remain valid in a rapidly changing UK and international funding landscape. However, pools should evolve to take account of the greater expectations around impact, multi-disciplinary collaboration and global challenges in the UK competitive research funding space. Hence we think that ***the Sector working in partnership with the SFC should see pools as one mechanism for accelerating the growth of disciplinary OR multi-disciplinary capability in order to address emerging global challenges and/or opportunities in a planned way***. This requires a commitment on a sustained basis from SFC and Scottish Government to invest in selected pooling initiatives without too much constraint on what a pool needs to "look like". It also requires a transparent "system" that is flexible and agile enough to allow the Sector and SFC to move quickly when required.

Without reference to budgetary constraints we would see perhaps ***one new pooling initiative per annum as a realistic level of activity*** in the context of the "system" proposed above. Alongside the commitment to new pools there should be a recognition that some reconfiguration, where this is more appropriate for the current research landscape, may support the evolution of the system.

We think that ***pan-Scottish Graduate Schools and/or cohort-based PGR Environments involving outside organisations are a feature of pools that should continue to be supported even if SFC/ SG decided that pools per se are not***.

Section 3: Anything else

Any further perspectives on the introduction, implementation and impact of research pooling are welcome.

The pools added to many research groups' opportunities to expand their activities internationally and tangible benefits continue to accrue through the international activities pooling supported. Even small levels of funding directed to support short Early Career Researcher visits to leading international centres gave those researchers valuable exposure on the world stage.

Pooling also encouraged capital equipment and cross-institutional sharing policies. This impacted on joint publications and increased co-supervision/participation in high quality projects. The impact of pooling via state of the art equipment investment on research capability and competitiveness should not be underestimated.

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