

Independent review of the Scottish Funding Council's Research Pooling Initiative

Oral evidence summary

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Introduction

The panel received oral evidence from 43 witnesses over three days in March 2019. A full list of those invited and those who attended each session is available [here](#). A full transcript of the sessions will be available [here](#).

1. Impact of the Research Pooling Initiative to date

1.1 Research pools perceptions

During the oral evidence sessions, the pools highlighted successes regarding the expected outcomes of pooling such as increased critical mass, increasing research income, recruitment of research stars, improving REF performance, availability of cutting edge equipment, international links and improved access to users.

The analytical work will test some of these assertions, however some examples recorded in the sessions are below:

'the original grant was £7.4 million from SFC across the universities and we've brought in more than 10x that over the funding period of SINAPSE' Professor Alison Murray, **SINAPSE**

'The universities can now, or have, recruited top class people from some other top chemistry departments in other parts of the country because they recognise that they're bringing together the chemistry departments, creating a stronger entity so they were able to bring in better people and that was then reflected in the REF performances' Dr Bill MacDonald, **ScotCHEM**

'SULSA ... set up a facilities equipment database and we also appointed technical experts to run those facilities and ... that's been one of the strongest success stories' Professor Mike Barrett, **SULSA**

'Our biggest success in the previous round was with IMI funding, the Innovative Medicines Initiative and with that we brought tens of millions in to build drug discovery development in Scotland' Professor Mike Barrett, **SULSA**

'we increased research active staff in Scotland in computer science by 15%' Professor Roderick Murray-Smith, **SICSA**

'Since beginning of SUPA, physicists in Scotland have won 36 European Research Council fellowship grants which is absolutely phenomenal' Professor Alan Miller, **SUPA**

1.2 Institutional perceptions

During sessions with institutions there were supportive comments on the success of pooling in increasing critical mass, improving REF performance, building collaborations and facilities sharing.

'I think one of the ways in which pooling was used very successfully was to attract international researchers, research groups to Scotland and in that respect also I would say there was some pretty strong metrics of success of being able to attract key researchers' Professor Jon Cooper, **University of Glasgow**

'they play a strong role in helping us to be stronger' Professor Mike Mannion, **Glasgow Caledonian University**

'it has increased the opportunities for the researchers by networking. I think it has exposed the research in Scotland internationally and improved the reputation of the research in Scotland because many of the research pools have now a lot of international partners or facilitated international partnership' Professor Ehsan Mesbahi, **University of the West of Scotland**

'[Heriot-Watt and Edinburgh] scored significantly better in my view than we'd have as individual submissions. I think critical mass is absolutely essential in REF so I think it brought critical mass, which was one of the weaknesses that was identified by the Scottish Funding Council at the time following the 2001 research assessment outcomes.' Professor Gareth Pender, **Heriot-Watt University**

'there is a benefit to institutions regardless of their size and skill from having that collaborative engagement.' Professor Paul Hagan, **Robert Gordon University**

One session with the institutions pulled out some alternative views about the sustainability of that initial impact:

'I remember it certainly generated an increase in the volume of some of the things we've done and I think some of the pools because they've been successful but I'm not sure if that has been really long sustained' Professor Jonathon Seckl, **University of Edinburgh**

'I think the administrative glue that we get [in the second phase] is so modest at this moment that it's almost irrelevant' Professor Derek Woolins, **University of St Andrews**

The same institutions highlighted the difficulty of evidencing the impacts of pooling and the lack of a counterfactual.

'There was a serious pulse of improvement in Scotland as a result of the funding..... what we've never been able to do is say is, "If we just spread that money around without pooling, what would the outcome be?'" Professor Derek Woollins, **University of St Andrews**

SUPA highlighted that it is difficult to attribute successes to the pools especially when institutions are inclined to claim the success for themselves. This point is repeated elsewhere.

1.3 External perceptions

The mathematics community representative (mathematics has no research pool), suggested that with a pool they could have done what they did anyway, but on a bigger, pan-Scotland scale. There

would have been benefits: when trying to attract top staff; more pan-Scotland events; increased contacts (with other disciplines through mathematicians in other institutions); bridging the gap meetings.

*'A pool would have made Scotland's mathematics more impactful. It might also have meant they could increase staff numbers (which actually fell from RAE 2008 to REF 2014)' - Professor Gavin Gibson, **Edinburgh Mathematical Society***

Scottish Government witnesses were relatively unaware of the outputs and outcomes of pooling and were keen to hear more 'stories'. They had a much greater awareness of Innovation Centres.

Scottish Government witnesses highlighted the importance of demonstrating value for money. In response to a targeted question around this following the session they submitted the response available [here](#).

The Chief Scientist's Office representative highlighted they recognise value in a different context – more in terms of the patient experience and, in their experience, SINAPSE do provide that. They also recognise SINAPSE have fostered a collaborative relationship between researchers and highlight that all students identify both with their host institution but also with SINAPSE.

1.4 Collaborative nature of the Scottish research base

A key theme coming through the oral evidence was the impact of pooling on the collaborative nature of the Scottish research base. A number of witnesses, from pools themselves, to institutions, the enterprise agencies and the Royal Society of Edinburgh provide anecdotal evidence of the collaborative and collegiate nature created by pooling.

*'...the research pools is probably one of the first elements within Scotland to instigate collaboration across the universities, and that impact has had a really long legacy and we can't underestimate that, although individual universities that can be competitive, in Scotland, lots of regions look at us enviously because we are so collaborative...' Dr Siobhan Jordan, **Interface***

*'the pools play a really important part in major initiatives. So for example we can line up the community behind certain initiatives which are obviously good and which if institutions had not established a collaborative culture might find more difficult to do' Professor Tim Bedford, **University of Strathclyde***

*'I met a doctoral candidate who was from Aberdeen in the corridor at St. Andrews and I said, "Oh, what are you doing here?" He said, "Well, I can be anywhere, I'm part of MASTS." That's true, it's part of this idea that you're part of a greater whole and there's an identity and a cohort to that' Professor David Paterson, **MASTS***

One group of institutions were clear on the supposed benefits to them of working in collaboration – the critical mass, the access to different expertise and facilities, the inclusion in large bids that they may not accomplish alone. They highlighted the ability to build on the existing collaborations to respond to large calls.

'it effectively means that all parts of Scotland are part of the research landscape' Professor Neil Simco, **University of the Highlands and Islands**

'[pools] were absolutely vital for the development of a couple of key areas for Abertay' Professor Nia White, **Abertay University**

'that both the contribution and the benefit from every institution can be differential as appropriate to the strengths and mission of each institution and that I think is a key point that argues in favour of the national capability' Dr John Rogers, **University of Stirling**

The Royal Society of Edinburgh echoed this view:

'[Pooling] makes it easier for particular academic individuals and groups to work together. It's a good opportunity for them.' Professor Julian Jones, **Royal Society of Edinburgh**

Another group of institutions recognised that pooling had contributed to creating a collaborative culture in Scotland, but questioned whether Scotland may now be capable of continuing this collaborative approach without additional structures such as the pools to facilitate this.

'I think pooling was very helpful in initiating that, but whether it is necessary to continue it I think is less clear.' Professor Jonathan Seckl, **University of Edinburgh**

The pools themselves, and others, doubted that the networks and benefits would sustain for long without continued support for pooling (see later).

Further collaborations

There was anecdotal evidence that other collaborative structures have been built on the back of that collaborative culture created by pooling – Innovation Centres, buy in to Interface and even how they collaborate through the Universities Innovation Fund.

'[pooling] was a catalyst to where we are now with other things that we're doing in terms of innovation centres and such like' Morven Cameron, **Highlands & Islands Enterprise**.

'[DataLab] was in a sense born out of SICSA' Steven Kendrick, **SICSA**

DTP/CDT success

There were mixed messages around Scotland's success in winning DTP/CDT funding and pools' role within that.

1.5 National (UK) and international perceptions of pools

It was not possible to receive oral evidence from international, or even wider UK witnesses, however, there is anecdotal evidence from the pools about their international reputations for example:

'We just made a video about SUPA, a six-minute video at the invitation of American Physical Society for their TV station which shows on YouTube and if you watch that video, I think you'll get a

real flavour of the engagement of our community. It was selected as an exemplar of collaboration and partnership. Professor Alan Miller, **SUPA**

And from institutions:

'you'll see that lots of other regions have copied Scottish pooling in all kinds of ways in terms of how they interact in terms of big equipments to research council and things like that, so in that criteria pooling looks to have led the challenge' Professor Derek Woollins, **University of St Andrews**

'there's an advantage when one is looking outwards and seeing Scotland as a country and it's hugely important when one is competing for funds outside of Scotland to show the collaborative work that goes on' Professor Mike Mannion, **Glasgow Caledonian University**

'the research pools provide an infrastructure to support the development of really good consortium and really good bids' Professor Neil Simco, **University of the Highlands and Islands**

1.6 The impact of pooling on policy and industry

Industry

A number of witnesses highlight that pools were not set up with economic impact in mind.

'Pooling was set up to boost the academic excellence and quality in the Scottish research base, to build capacity and capability and make us more competitive, the remit was never about engagement with industry' Professor Paul Hagan, formerly SFC R&I Director

'this idea that they're looking towards the industry/ business, it wasn't necessarily in the DNA of setting them up' Morven Cameron, **Highlands & Islands Enterprise**

The Enterprise Agencies however were highly engaged and knowledgeable about research pools.

Dr Siobhan Jordan, Interface, highlights that SMEs are probably not aware whether they are interacting with a pool as opposed to an individual academic, nor need they be. Ian Blewett, Scottish Enterprise, confirms that.

Interface does engage with a number of pools and has anecdotal examples of successful collaborations, Dr Jordan also suggested the facilities and expertise within institutions, funded through pooling, have been great for companies to use.

More than one witness notes that individual institutions have research offices for commercialisation (and own the Intellectual Property) and are more competitive (than collaborative) in this area which makes it harder for pools to get involved in business ventures.

The relationship with Innovation Centres is discussed in depth below.

Policy

There are clear links between some pools and policy stakeholders. MASTS and SAGES particularly asserted their close relationship with policy partners.

MASTS strategy largely mirrors the Scottish Government Marine Strategy which they see as one of their strengths. Professor Paterson asserts that many of Marine Scotland Science's young staff have been trained through MASTS.

SAGES have a strong ambition to grow their policy influence, an example of this so far would be placements of *'academics or student internships within institutes and arms of the policy units which have been very successful'* Professor Mark Inall, **SAGES**

Professor Inall has also discussed with the Chief Scientific Advisor (Environment, Natural Resources and Agriculture) how they can jointly develop a fellowship *'to try to investigate how one might create metrics for scientific advice to policy, so to try and give a framework that actually credits scientists who make some input to policy'*.

ETP have a role as *'an impartial advisor to the Scottish Government and their attempts to deliver the Scottish Government Energy Strategy,'* Stephen-Mark Williams, **ETP**.

While SICSA themselves don't highlight their policy advice role Ian Blewett from Scottish Enterprise is clear that he values them in this role *'almost like a sort of free consultancy on the side'*.

2. The research pools in the present-day research environment

'we've got to recognise that they were originally set up to support research excellence. The reason for setting them up was to drive performance through REF ... But the world has changed so universities are now seen as a means of driving economic impact' Professor Gary Pender, **Heriot-Watt University**

'critical mass and working together to create efficiencies is even more important in the current economic climate.' Professor Alan Miller, **SUPA**

2.1 First phase/ second phase – institutional perceptions

There is a clear divide between the two phases of pooling support. The initial phase characterised by large investment and exciting developments and the continuation phase characterised by tight budgets.

As Professor Jonathon Seckl, University of Edinburgh, points out a review at the end of the first phase might have had different outcomes from a review of pooling now.

The first set of institutions to give evidence were agreed that research pooling considerations rarely crossed their desks in the current environment, and this is borne out by the pools themselves.

'[In the first phase] heads of departments and vice principals of research, were obviously highly engaged in that process [...] But nowadays, now that we're in an administration funding only role, it's much more difficult to actually get their attention.' Professor Alan Miller, **SUPA**.

The other sets of institutions continued to be more involved and much more aware of current activity and benefits of pooling.

'we have ongoing constant discussions formally and informally about our involvement in research pools and what outcomes there should be' Professor Ehsan Mesbahi, **University of the West of Scotland**

2.2 External perceptions

'strong academic research pools [are] absolutely fundamental to supporting Scotland's industries,' Dr Siobhan Jordan, **Interface**

Scottish Enterprise see a variety of roles for pools in the current environment. They:

- Inform international mission statements and represent Scottish research internationally;
- Inform policy and horizon scanning;
- Are used to 'hang' other investments on – and are neutral actors if they include all institutions;
- Provide a consensus;
- Offer a one stop shop/ single door for expertise;
- can *'be representative in things like the Innovation Centre boards, to have someone there representing academia through the lens of a research pool is much less partisan in having an individual higher education institute represented there'* Ian Blewett, **Scottish Enterprise**

Scottish Government, although they did see a role for pools in providing a representative voice, were less clear on the role of pools. It's possible that different arms of Scottish Government have greater knowledge of pools where they are have a more direct relevance to policy.

2.3 Pools' current strategy

In discussing their current strategies some key themes emerged around:

- leveraging additional funding;
- acting as a front door/gatekeeper;
- international representation; and
- enhancing the postgraduate/ ECR experience.

Pools also gave examples of how they were beginning to work together e.g. SINAPSE, SUPA and SULSA.

'Interdisciplinary work across the boundaries of pools is the new strategy' Professor Alan Miller, **SUPA**.

Small amounts of funding

A key theme emerged around the impact that small amounts of funding can have: in building networks and collaborations; in improving the postgraduate/ECR experience; and in leveraging additional funding.

'this small amount of lubrication that a little bit of public money gives. It gives you a cause to come together and then achieve some leverage' Professor Julian Jones, **RSE**

'often the small sums of money to make things happen, are difficult to secure. [...] to build collaboration and write grants together, the travel to see people both at European level and within Scotland, to bring lots of people together, there isn't a ready source of funding in institutions for people to find that money' Professor Paul Hagan, **Robert Gordon University**

'And if you did take away that funding, there are small things that won't happen like putting groups together who then go and write a project. [...]it's a small amount of glue that holds together quite a large structure' Professor David Paterson, **MASTS**

2.4 The relationship between research pools and Innovation Centres

The relationship with Innovation Centres (ICs) was highlighted as an issue widely, not just by the pools but also the institutions, SFC, Interface and others.

Interaction with ICs is varied, in the session with Innovation Centres two distinct views were expressed.

'We leverage their capability in terms of their networks into the breadth of the universities where my team don't have the bandwidth often.' *'we're all driving in the same direction'* Gillian Docherty, **DataLab** - on SICSA in particular although they also work closely with other pools.

The Oil & Gas Innovation Centre (OGIC) had a different perspective – they found the pools hard to engage and uninterested in solving practical problems for industry.

The pools raised the relationship with ICs as an issue, not necessarily a tension as such, but there was a clear desire for more formal engagement.

Pools also found interaction with the ICs variable, there are some good examples such as the relationship between SICSA and DataLab and between SULSA and IBIOIC and these should be highlighted. Pools however were looking for a more strategic relationship and were keen for SFC to take ownership of creating those strategic relationships.

SUPA find, for example, the Higgs Innovation Centre much easier to interact with than the SFC funded centres.

'there's a distinct lack of coordination and I think there's been opportunities missed because of that' Stephen-Mark Williams, **ETP**

'more activity in coordinating their [SFC's] different funding instruments would be very welcome and particularly the funding instruments of pools and innovation centres for some more oversight to come to those initiatives.' Professor Mark Inall, **SAGES**

Stephen-Mark Williams, ETP, suggests that the strategic IC documents should have had a clearer reference to pooling. Ian Phillips, OGIC, comments that it would have been beneficial to him to have been clearer on what pools were earlier.

'Could we have arranged for more cooperation, collaboration, and a closer engagement? We probably could' Professor Paul Hagan, Director R&I at SFC at the time of IC development

All were agreed that this relationship was important and that pools and ICs should be working together, with a number highlighting the role pools could play in extending the ICs reach into the academic community.

'there is still a need for more education/ communication between ICs and pools' Morven Cameron, **Highland & Islands Enterprise**

'Currently, things are pretty strategic in terms of we have pools and we have innovation centres but let's pull them up to the next level' Dr Caroline Cantley, **SRPe**

'unless you've got a strong fundamental research base, you're never going to get any innovation'
'Should they be working together? Absolutely yes they should.' *'the innovation centres should be harnessing the quality in the research base in Scotland'* Professor Lesley Yellowlees, **SFC Research & Knowledge Exchange Committee (RKEC)**

In addition to this, the point is raised a couple of times that the way ICs have developed is too industry focussed/ industry led. That they only interact with academia when they have an ask from industry but actually there should also be a push out of academia into industry.

'innovation centres were much more focused on that industry academic link but it was very much driven by industry and I think that's only 50% of what we can deliver. There should definitely be stronger links looking to promote academic work into industry rather than industry asking questions of academia' Professor David Paterson, **MASTS**

3. Lessons learnt from research pooling

3.1 Impact of geography on institutions' involvement in research pooling

Geography was only mentioned once, in the context of ICs where OGIC thought perhaps they missed out on casual interactions because of their northerly position.

3.2 Design/ implementation

Professor David Gani, Director, Research Policy and Strategy at SFC at inception of pooling, discussed the process of setting up the research pools, confirming that it was a bottom up process, the first stage of which was that pools had to self-organise and agree their strategic objective. Pools were considered in other areas of the research base, for example in arts and humanities, and investments, albeit smaller, were set up, some with much success i.e. the Scottish Institute for Policing Research (SIPR).

'they had to work together upfront and part of that decision-making process about who we'd fund would be if a group of universities would actually be able to self-organise in a way and put a proposal in. So the first bar was 'can you work together and identify strategic priority for Scotland for your area' Professor David Gani, Formerly Director RPS, SFC

Professor Gani, highlighted that there is a limited number of post grads, PhD students, quality staff, research funding out there to win and SFC invested enough in each area to win enough to make a step change – further investment would not have been more effective.

Professor Yellowlees, RKEC, emphasised that setting up the pools was an iterative process as was how the pools continued to develop and that this was helpful in ensuring that no opportunities were missed.

3.3 Lessons about making collaborations work effectively

In initially setting up the pools strong leadership was important, as was building up trust through even-handedness and transparency. Strong pools appear to have been more strategic with a leader providing a strategic vision.

'setting up a system that was fair and open was absolutely critical' Professor David Paterson, **MASTS**

There is much in the oral evidence about the importance of studentships in building collaborations and as a way of engaging institutions.

'Certainly from SULSA's perspective studentships were really instrumental in getting things going' Professor Mike Barrett, **SULSA**

'co-supervision across institutions helped build the trust and confidence that this was a valuable exercise and that it could be made to work.' Professor Paul Hagan, **Robert Gordon University**

A number of witnesses commented on the importance of purchasing large pieces of equipment as a contributory factor to the success of building a collaboration.

'it's tended to work best in subject areas when you can achieve that leverage and gain substantial amounts of external funding, which means it's probably always going to work a bit better where there's experimental research that needs facilities, where there's a culture of graduate schools, where there's a culture of winning significant Research Council funding'. Professor Julian Jones, **RSE**

SIRE was largely an investment in staff and Professor Ulph, previous Director, SIRE, highlighted that without shared facilities, like for the sciences, it was harder to be inclusive for everyone, not just the SIRE staff, to create that collaborative feeling. Money to support early career researchers did help to engage people.

Many highlighted the strategic vision of the pool as a leading factor.

'SUPA had a clear strategy around its graduate school, a clear strategy around internationalisation of the graduate population in physics...' Professor Jon Cooper, **University of Glasgow**

'Worked best where people were able to look beyond the benefits to their own institutions and focus on what they could achieve together.' Professor Julian Jones, **RSE**

When considering who was ultimately responsible for the success of a pool witnesses highlighted different angles. Some focussed on the leadership, others thought the SFC were ultimately responsible as the funders, others suggest the front line researchers are the ones who actually make a collaboration work. No one placed responsibility for success with the institutions.

Overall Professor Yellowlees summarised:

'It worked because everyone involved wanted it to, because they saw that it was to their benefit'
Professor Lesley Yellowlees, **RKEC**

Professor David Paterson, MASTS, noted the benefit of having a governing council in supporting the officers against institutional bias, not that this was required regularly.

Pool Leader

The pools and institutions reflected on the importance of a good leader to the success of a pool and what qualities made for a good pool leader. Vision, respect, enthusiasm and magnanimity were all highlighted.

'it's the academics who are on the board leading it, together with the chair, to provide vision of leadership and where we have pools that've got vision of leadership, we see that they're working extremely successfully' Professor Tim Bedford, **University of Strathclyde**

'directors are very important and the character of the directors, so it's the agenda and the tone that they set' Professor Nia White, **Abertay University**

'Whoever is leading the pool cannot lead for their organisation, it has to be for the benefit of the pool' *'an executive director who really wanted the pools to work was critical'* Professor David Paterson, **MASTS**

A couple also highlighted the importance of effective organisers beneath the leader.

'We also need a strong executive or CEO and a solid team, albeit small, behind them to be efficient about how we spend our time and resources because there isn't a lot of funding available' Dr Caroline Cantley, **SRPe**

4. Future of research pooling

4.1 Sustainability

In the first institutional session Professor Seckl, University of Edinburgh, suggested that pools were not self-sustaining.

Conversely a number of witnesses, argue that the large scale investment, the facilities and kit and academic appointments were sustainable because they have been sustained by institutions.

'in the context of sustainability, those researchers who came on short term or a fixed term funding in

principle because it was pooled funding, I don't think any of them were let go at the end of the pooling funding' Professor Jon Cooper, **University of Glasgow**

'But have the pools on the whole been sustainable? Yes, they have because the staff that were brought in, so far as I'm aware of in all the pools, when the SFC funding stopped, no member of staff that was brought in was made redundant' Professor Lesley Yellowlees, **RKEC**

It is harder to sustain the core central function of a pool and collaborative activities, often small scale but which can lead to bigger benefits. Institutions currently put money into this collaborative effort through 'match funding'. There are different models, some pools charge a membership fee (sometimes with different levels of membership) others receive a straight contribution (sometimes partly 'in kind') from institutions matching the SFC investment.

The pools considered why this may be the case and argued that often the small amounts of funding needed to carry out this type of work was below the radar of Vice Principals or the accountants who made funding decisions. Equally it could be difficult to attribute successes from those activities back to pools

'even if you can prove to them [HEIs] that there's huge leverage to be had from the pooling initiative, their short-term incentives may not match the long-term potential of pooling' Professor Mike Barrett, **SULSA**

4.2 Strategic role for SFC

All pools, and some institutions, agreed that a small amount of funding from SFC would not only encourage the institutions to continue to contribute but would also allow the SFC to have a strategic input to further development of the initiative.

'it's more than just the investment, it's the commitment and the common strategy development that matters. So the universities will continue to collaborate with each other, they will have strategic discussions. It may not be pan Scottish, that's the problem. [...] I think you need to continue to take the Scottish approach' Dr Caroline Cantley, **SRPe**

'the second lower funded continuation phase – [...] is the sustainability model – institutions already put in two thirds (for SUPA) and will continue to do so. But [...] you need SFC funding to lever that and to show direction from SG and to allow SFC to have a say in the initiative.' Professor Alan Miller, **SUPA**

'What you will get is each institution will do what is best for the individual institution. So you'll get an institute, the choice is made on an institutional basis which is absolutely what you should expect us to do or the rational thing to do, you won't get those made from a Scottish strategic point of view and that's what the funding council does.' Professor Tim Bedford, **University of Strathclyde**

4.3 Role of pools in the current/ future landscape

'If we didn't have pools we would want to create them' – Professor Paul Hagan, **Robert Gordon University**

The evidence included a myriad of suggestions for the pools going forwards: Developing the single voice, lobbying, international representation, co-ordinating bids, horizon scanning, collaborating together to work in a challenge focussed way, acting as a funding vehicle delivering small levels of funding, vehicle to hang other funding, collaborating with policy and industry.

Some of the more common themes are explored in more detail below.

4.3.1 Representation

A role for pooling as a single representative voice for the academic sectors, or even the research community as a whole was highlighted in a number of contexts.

An example of this would be SRPe representing Engineering in development of the National Manufacturing Institute for Scotland.

Scottish Government also saw pools as a good way for Government to interact with the different academic areas through a single point. For example, the Minister met with pooling directors as a representation of the research community to get advice on the effects of BREXIT.

'[if we] wish to involve the research base or the universities then the existence of those research pool structures where you can have the entire, for example engineering community in a room personified by somebody who's representing that whole community, we don't need to set that up from scratch because it exists.' Dr Stuart Fancey, **SFC**

The pools definitely saw a role for themselves in this area. The majority (if not all) included in the forward strategy acting as a single entry point or gatekeeper to their research community. DataLab highlighted how important SICSAs playing this role had been for them.

4.3.2 International/ BREXIT

An extension to this representational role could be in representing the sectors internationally, both in creating and developing new international links but also maintaining European links in a post-Brexit environment.

Pools representing Scottish research internationally would allow all institutions and all expertise to be represented in a single trip as well as providing a distinctive united face to the rest of the world.

'one of the next steps has to be international. Where does Scotland want to form its partnerships... the future shape of pools could provide some shape and direction to that because we do need to step up.' Professor Derek Woollins, **University of St Andrews**

'a mechanism to maintain links across Europe as well which would allow access to a greater collaboration' Dr Liz Rattray, **University of Aberdeen**

'It wouldn't be that hard to think about introducing dimensions into research pools, which encourage the formation of international relationships by putting small amounts of money in' 'It's the small amounts that allow leverage which alters behaviour'. Professor Julian Jones, **RSE**

'international selling point that if you are getting access to a Scottish university you are effectively getting access to all of them through the pool' Professor David Gani, formerly SFC

4.3.3 Collaborative foundation for leverage

There appeared to be widespread support for pools acting as the basis for collaborating on grand challenges to lever available funding and for SFC to support that collaboration.

'something that we are missing out on in Scotland is having bodies that can help us to coordinate across the universities to respond quickly to calls' Professor Nia White, **Abertay University**

'good foundation for collaborative responses to challenge-led opportunities' Stuart Fancey, **SFC**

Scottish Government were also supportive of a role for pools in building the collaborations to bid for UK funds.

In particular it was asserted a number of times that Scotland was not doing well in Industrial Strategy Challenge Fund (ICSF) and Global Challenges Research Fund (GCRF) and there could be a role for the pools in accelerating that.

'one thing the SFC could do is throw more money out at targeted individuals who would lead. It's a huge task to lead GCRF or industrial strategy challenge fund.' Professor Mark Inall, **SAGES**

'I'd like to see a strategic forum for us all to help shape our strategies, to point in the same direction and that will also identify gaps for the future, and help the funding council and other government bodies to shape their strategies accordingly' Dr Caroline Cantley, **SRPe**

4.3.4 Disciplinary vs challenge-led

There was wide recognition of the current funding and attitudinal shift from discipline based research to more challenge-led multidisciplinary research and a recurrent theme was the juxtaposition between discipline-led and multi-disciplinary, more challenge-led pools. The panel heard a range of views on whether current/ future pools should maintain a disciplinary focus or move to a more challenge-led basis.

Some argued that challenge-led is where the money is and that is the way forward.

'there would be benefit to broadening their agendas or their outlook to encourage more cross disciplinary, interdisciplinary, different kind of problem space areas...' Professor Nia White, **Abertay University**

Others advised a more cautious approach, highlighting the need for strong disciplines, the danger of short termism and chasing the funding.

'how do you make sure your underlying disciplines, your researchers, are well-positioned to be able to take up the next grand challenge or whatever is the flavour of the month?' Professor Lesley Yellowlees, **RKEC**

'I think we need strong disciplines if we're going to have the interdisciplinary bit. If you have the strong disciplines then you can overlay a thematic bit.' Professor Paul Hagan, **Robert Gordon University**

Stephen-Mark Williams, ETP, notes that challenge based funding is ephemeral and you need to support the blue skies working because you don't know what tomorrow's problems are, never mind what knowledge you will need to solve them.

'you never know when a new challenge is going to emerge and do you have the right skills to address it' Dr Scott Lilley, **ScotCHEM**

The second group of institutions supported thematic development especially the inclusion of arts and humanities. Not that they don't support continuation of the discipline based pools, just that there's no need for more.

'there's an interesting issue about how the pools iterate with the Scottish graduate schools in arts and humanities and in social science which obviously sit outside pools' Professor Neil Simco, **University of the Highlands and Islands**

'If you looked across all of our strategies, you would see a focus on themes, on programmes, on challenges and I think if there are to be strategic interventions across the sector then that's really where they should look' Dr John Rogers, **University of Stirling**

Going forward Professor Barrett, SULSA, suggests more collaboration between pools and using the existing pooling infrastructure to pursue the government's agenda and priorities in research.

Professor Jones, RSE, acknowledges the change from disciplinary to multidisciplinary-challenge-led focus (and that that change is wider than just funding based, it's in public perception too). He talks of a 'third axis' of industry and policy to truly address societal challenges and that the pools maybe need to evolve in that direction.

'I think you can do it by adding a little incentive for cooperation between pools' Professor Julian Jones, **RSE**

'welcome a challenge-based approach to pooling, because I think that gives a mechanism for bringing together disparate groups and mathematical sciences (under one) umbrella, and maybe overcoming some of the fragmentation that you get by looking at the traditional disciplinary boundaries' Professor Gavin Gibson, **Edinburgh Mathematical Society**

4.3.5 Additional resource

When questioned on what they would do with unlimited resource to invest in research pools the most common answer by far was to invest in studentships. Highlighting that these were often what held a collaboration together; what engaged the researchers (and the large institutions); was a means of collaborating with industry/ policy and would go some way to address anomalies introduced through the DTP/CDT system.

'industrial PhD studentships, they are the sort of resource that gets people from the serious universities engaged' Dr Caroline Cantley, **SRPe**

'studentships, especially industrial studentships – as a way of getting the 'serious universities' to engage. That's what pulls the academics in and it is them which make the pool work' Stephen-Mark Williams, **ETP**

The second most common theme was around increasing the funding for the core team within pools to allow more targeted work on identified areas such as international representation, providing policy input, building proposals to leverage additional funding especially around GCRF/ISCF type investments.

'I wouldn't be asking necessarily for the funding council to put in tens of millions of pounds [of] capital investment for equipment or infrastructure. It would be more about getting a greater core team of people to actually cover all of the areas we need to... there are many, many other opportunities that we could exploit much better with a greater core team of people coordinated at a strategic level.' Dr Caroline Cantley, **SRPe**

Only a couple of institutions suggested that additional funding would be better used elsewhere.

'I would suggest gently that the best use of the money would be to give it to the institutions and charge them with delivering on strategy rather than funding it directly' Professor Jonathon Seckl, **University of Edinburgh**

'I'd put it into interdisciplinary research in my institution.' Professor Derek Woollins, **University of St Andrews**