

Knowledge Exchange Framework Consultation 2019

Research England

Submission from the Royal Academy of Engineering

March 2019

About the Royal Academy of Engineering

As the UK's national academy for engineering, we bring together the most successful and talented engineers for a shared purpose: to advance and promote excellence in engineering.

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Purpose

1. Regarding the stated purposes of the Knowledge Exchange Framework (KEF):
 - a. The Academy agrees that the KEF as outlined will provide universities with new tools to understand, benchmark and improve their performance.
 - b. The Academy somewhat agrees that the KEF as outlined will provide business and other users with more information on universities.
 - c. The Academy agrees that the KEF as outlined will provide greater public visibility and accountability.
2. The Academy believes that KE is of fundamental importance, and is therefore strongly supportive of the KEF, and of a long-term approach to developing and improving the effectiveness of UK KE activities. KE is vital to ensuring that the UK captures value, both economic and social, from its investment in research, much of which is publicly funded. Assessing KE should account for a balance of knowledge creation, knowledge dissemination and knowledge application. The KEF presents a welcome opportunity to encourage, recognise and incentivise KE, providing balance with teaching and research. Concurrent improvement of all three frameworks, including consideration of burden and coordination, should be a wider goal.
3. Time constraints placed on the KEF have introduced limitations to what is feasible now. However, this should not prevent consideration of future evolution of the KEF, through strengthening the methodology, and developing appropriate, robust new metrics. This will ensure it truly delivers against its ambitions.
4. The Academy agrees with the first purpose. Collating and presenting the proposed metrics in this new format is commendable, and provides minimal burden, however the information it will provide is limited. The proposed metrics only capture a limited selection of all KE activities, with a focus on quantity rather than quality. Furthermore, many of the metrics are already collected and were designed for other purposes, meaning they do not always capture the most pertinent information in relation to the KEF's purposes. Many HEIs have KE strategies directing their activities; these cannot be captured or considered within the KEF as proposed. Greater opportunities to submit narrative could address this issue and some of the limitations of the proposed metrics.
5. The second purpose has potential, but the information that matters most to businesses is at a level of detail unlikely to be compatible or useful for the other KEF purposes, and which are not covered within the proposed metrics. The Academy previously recommended that extensive engagement with businesses and other external 'users' of research would be necessary to determine what metrics they are interested in.
6. The Academy supports the third purpose - as proposed, the KEF would achieve this.

7. It is unclear to what extent the output of the KEF – status within a benchmarked cluster – will incentivise and enable improvements in KE. If other incentives such as financial rewards are to be incorporated (e.g. HEIF), it will be essential to reassess the purpose and design.

Aims and overall approach

8. The Academy somewhat agrees with the overall approach of the KEF - an annual, institutional level, largely metrics driven exercise, noting that narrative will have an important role.
9. The Academy believes the KEF should endeavour to capture and evaluate the full breadth of KE. While using metrics, especially pre-existing metrics, does minimise the burden for institutions, there are important aspects of KE which will not be captured without the use of narrative.
10. A stronger emphasis on narrative, taken into account in a meaningful way, would allow HEIs to highlight the potentially transformational impact of the chosen metrics and expand upon the extensive elements of KE activities that fall beyond them. HEIs' strategic approaches to KE are pertinent to institutional characteristics and influence the volume and range of their KE activities; broader provision for narrative would allow strategies to be taken into account. Diversity is a strength of UK HE: narratives can provide such context, underpinned by evidence that could stimulate cross-sector sharing and increased national value creation.
11. The proposed metrics capture only a narrow range of KE activities, with a focus on volume measures rather than quality. For example, the metrics do not account for innovative approaches and the effectiveness of engagement. Although the use of existing metrics does minimise the additional workload for institutions initially, we would question whether in the longer-term, without reassessment, this could drive a distorted KE focus, with HEIs focussing on 'improving' within the narrow set of metrics proposed, rather than improving their KE performance in a more holistic way.
12. Existing data collated for the HE-BCI survey forms the bulk of the metrics proposed for the KEF. The Academy is aware of concerns about the comparability and ability to audit elements of this data. Iterations of improvement should occur were the KEF to be implemented as proposed – an additional aim could be to develop standardised, appropriate new metrics to allow the KEF to fulfil its stated purposes. Within the changing and increasingly complex landscape HEIs operate, the KEF could be an opportunity to use innovative metrics, such as those involving data mining to derive information and support evaluation and comparative measures of impact.
13. In our previous submission to the 2018 KEF metrics technical advisory group, we highlighted that the KEF could be used to address shortfalls in the REF impact element. The KEF should not be considered as an alternative for the impact element of the REF: as proposed the two measures are complementary but distinct. However, the REF environment element may also capture information of relevance for a holistic, focused KEF.

Clustering

14. Regarding the proposed clusters and clustering approach:
 - a. The Academy somewhat agrees with the conceptual framework that underpins the cluster analysis.

- b. The Academy somewhat agrees with the variables and methods employed in undertaking the cluster analysis.
 - c. The Academy somewhat agrees with the resulting make up of the clusters, i.e. the membership.
 - d. The Academy somewhat disagrees that the overall approach to clustering helps Research England to meet the stated purposes of the KEF and ensures fair comparison.
15. Clustering is a practical and pragmatic approach which will never be perfect and satisfy every party. However, some aspects of the clustering, in combination with the metrics proposed, could potentially impede the KEF from achieving its stated purposes. If the KEF is eventually to be used for assessment and perhaps funding decisions, the ability for more nuanced comparison is essential.
16. The Academy welcomes the methods and range of variables within the clustering analysis. Consideration for the disciplinary mix of institutions, and how this can influence KE volume and outcomes, was something we called for in our previous submission. However, as presented, these different considerations cannot be interrogated separately, which we believe would broaden the usefulness of the KEF by allowing nuanced comparisons. For example, the clustering analysis highlights that within clusters there is broad variability on the competitiveness of the LEPs associated with each institution. The ability to compare across clusters with regard to the local economic context of an institution is something that should be considered. Similarly, designing the KEF so that information can be inputted and extracted by broad discipline would increase its usefulness to HEIs, businesses and other users of research.
17. HEIs have different institutional strategies, which include different strategic approaches to KE. This will have a significant influence on the volume and range of KE activities they undertake. The KEF should be designed such that it does not penalise a HEI's ability to take a strategic approach to knowledge exchange, but this needs to be balanced against the KEF having the ability to assess HEIs' performance. Institutions within a cluster may find that due to their KE strategy, or some other key factor such as disciplinary mix, some aspects of their KE activity may be more appropriately compared to HEIs in other clusters. To achieve the stated purposes of the KEF and ensure fair comparison, it should be possible within the KEF to compare between clusters, either in this iteration of the KEF or in the future as it develops.
18. Only allowing comparison within clusters suggests that the KEF is solely about comparison and ranking, and not about giving HEIs the means by which to improve their own KE performance by learning from institutions beyond their cluster. The ability to compare across clusters can also help highlight and value the diversity of KE that can exist (and innovative forms that could exist in the future).

Perspectives and metrics

19. Regarding the overall range of perspectives and metrics outlined in the consultation document, the Academy somewhat agrees that a sufficiently broad range of KE activities is captured.

20. The Academy agrees that KE covers an extremely diverse range of activity. The seven perspectives broadly map to five of the groups of KE activities the Academy previously identified: technology transfer and commercialisation; collaboration & mobility; business growth and competitiveness; regional engagement; and, societal and cultural engagement and impact, with the notable exceptions of international development and people.
21. Research increasingly delivers international development impacts. There has been concomitant growth in the KE activities that support international development, usually with institutions within partner countries. KEF metrics should be able to capture the KE activities that promote economic development and social welfare of partner countries, and avoid excluding or disincentivising this important activity. Additionally, in the context of Brexit, understanding the volume and nature of international KE activity broadly is likely to be important - something that the proposed metrics would be unable to communicate.
22. The engineering community perceives that one of the most significant impacts of academia is the 'impact of people' associated with introduction of skilled graduates and postgraduates to the workforce. A measure of graduate employment locally, nationally, or overseas students returning home, would be a potentially useful measure. This is difficult to capture, but should be seriously considered as an aspiration of the KEF.
23. While the perspectives are relatively broad, the number of metrics under each are low and focussed more on quantity than quality, meaning they are limited. The KEF should seek to identify metrics that reveal the nature and effectiveness of the KE activities underpinning the data. While the need to implement the KEF quickly and the commendable desire to avoid unnecessary burden has resulted in the use of pre-existing metrics, opportunities have been lost to develop metrics that focus more on quality. The absence of narrative elements for all but two of the perspectives also limits the diversity of KE captured.
24. An annual exercise should allow for the KEF to be undertaken longitudinally, measuring and recording long-term outcomes – this will aid in assessing how institutions develop their KE activities over time, and also in making the metrics more useful to external stakeholders. Thought will need to be given to the timescales of the activities the KEF metrics will capture, as often a long-term lens will be more indicative of the success.
25. Equality, diversity and inclusion (EDI) are also noticeably absent from the perspectives and metrics, which should be addressed as a matter of urgency.

Perspective 1: research partnerships

26. Measurement of in-kind contributions to research is challenging to measure consistently and is consequently reported differently by different institutions. If one institution is setting this to zero by default, and others are estimating a different figure, this metric is skewed, and becomes useless both for benchmarking universities and for informing businesses. The Academy believes that there are inconsistencies such as this in the way HEIs respond to HE-BCI data collection – the KEF could be a way to provide clarity and rectify this. The proposed metrics focus on quantity and to an extent financial proxies for quality. The perspective would benefit from measures that look more holistically at what research partnerships entail, such as repeat business, longevity of partnerships, and co-location of staff.

27. Both of the metrics for this perspective could give a further breakdown of the non-academic partners into categories, such as commercial, NGO, public.

Perspective 2: Working with business

28. The metrics described for the *Research partnerships* perspective have considerable overlap with this perspective if they can be broken down by the non-academic partner.
29. The metrics proposed for this perspective have two different characteristics. Income from contract research and consultancy suggest quite transactional relationships with businesses, while Innovate UK income could indicate a more collaborative approach.
30. Consultancy income through established routes and mechanisms of an institution is measurable, but it is extremely difficult for institutions to capture the activities of academics operating independently.
31. For all three metrics, financial contribution is being used as a proxy for quality and gives a narrow interpretation of what the goal of working with businesses is. The use of metrics either now, or in future iterations, that focus on assessing the quality and effectiveness of universities working with business and look more holistically at what is involved would be more informative and align more closely with the first purpose of the KEF.
32. For example, metrics could capture the number of CASE studentships, and other comparable schemes part-funded by industry and requiring the PhD student to spend time in industry, as a proportion of total PhD studentships. Broadening the metric to account for all PhDs with a financial contribution from industry or where a student spends time in industry should be considered. Data should also be collected on the number of Knowledge Transfer Partnership staff involved, and the types of businesses involved. The number of academic/corporate co-authored publications could be included as a metric. Additionally, figures on the number of graduates working in local businesses, in different regions or elsewhere in the world would be useful to businesses, as would the number of degree apprenticeships or placements.
33. Collaboration between HEIs and businesses, as well as other external organisations, such as local councils, hospitals and charities, is a well-established and effective mechanism of KE. As noted in the Dowling Review, strong, trust-based relationships are at the heart of successful collaboration. People who can work in both business and academia and who excel at collaborative and translational activities need to be valued and recognised. Metrics that can identify the type and effectiveness of collaborations, and that can measure mobility between HEIs and industry, as well as other organisations, should be a priority for inclusion in the KEF metrics system.
34. Consideration may be given to academic or industry collaborations supported by, or undertaken within, major national initiatives and programmes.

Perspective 3: Working with the public and third sector

35. Equivalent metrics to those suggested in the working with business section - metrics that can identify the type and effectiveness of collaborations, and that can measure mobility between HEIs and other organisations, should be a priority for inclusion in the KEF metrics system.

Perspective 4: Skills, enterprise and entrepreneurship

36. Given that two of the three metrics focus on income from the provision of continuing professional development and continuous education, consideration should be given to renaming the perspective to more accurately reflect what is being measured unless alternative metrics are considered now or in future.
37. The 'impact of people' associated with introduction of skilled graduates and postgraduates to the workforce, who transfer knowledge and facilitate translation, is one of the greatest KE activities undertaken by HEIs, but this is not captured by the metrics.
38. Additionally, the activities undertaken by universities in support of enterprise and entrepreneurship are much broader than just graduate start-ups. KEF metrics could capture the number and value of competitive awards held by HEIs and their staff to support commercialisation and entrepreneurship. The Royal Academy of Engineering's Enterprise Fellowships, the Enterprise Fellowships run by the Royal Society of Edinburgh, and the Innovate UK ICURe awards are all examples of competitive awards that could be included in the KEF metrics system. Alternatively, these proposed metrics may better fit with the *IP and commercialisation* metric.

Perspective 5: Local growth and regeneration

39. The proposed metric is income-based, and gives no account of the diversity or effectiveness of KE activity with regard to local growth and regeneration.
40. Input from economists and other individuals with relevant expertise on the civic duties of HEIs could help to identify or design metrics which would be truly useful within this perspective. It could also be possible to interrogate metrics from other perspectives with a local lens, examining the impacts to local areas.
41. The inclusion of narrative is welcomed, but should be extended to all of the perspectives.

Perspective 6: IP and commercialisation

42. Some subject areas have a disproportionate prevalence in producing IP income (such as life sciences with drugs patents), which could have the effect of 'drowning out' the signal from the other metrics alongside it and making comparison more difficult. Any way of controlling for this, flagging it (perhaps through additional narrative), or allowing interrogation by subject would be welcome.
43. As for many of the metrics, the three for this perspective use finance as a proxy for quality, and that relationship is strongest here. Nevertheless, there are many other metrics that could be collected and developed to holistically assess IP and commercialisation KE activities. While the UK clearly has many strengths in research commercialisation, the overall perception in the UK engineering community is that there is still room for improvement. The development of the KEF metrics system offers the opportunity to recognise the strengths of HEIs' approaches to KE, and to potentially incentivise improvements in practice.

44. The *University Knowledge Exchange (KE) Framework: good practice in technology transfer* report, published by the McMillan group in 2016, suggested that key performance indicators (KPIs) for technology transfer should include qualitative measures, such as repeat business (such as with investors and industry). The Dowling Review suggested that universities that are confident with their technology transfer performance should publicise similar metrics, including the time taken to agree contracts, to highlight their efficiency and effectiveness. Understanding if any of those measures could be sufficiently standardised across HEIs, such that they could be incorporated into the KEF, should be considered. The particular value of these measures is that they capture the 'user' perspective. However, careful development of these metrics, with thought given to the possible effects of selection, should be the aim. This is to prevent perverse incentives, and to ensure that robust metrics are developed that work for both universities and businesses.
45. In addition, whether a university has its IP policy publicly available should be considered as a KEF metric. Similarly, provision of publicly available guidance regarding the spin-out process should also be considered as a KEF metric. Consideration would need to be given to what level of granularity would be appropriate for inclusion as a KEF metric.

Perspective 7: Public and community engagement

46. The Academy appreciates the difficulties that come with trying to record, measure, and evaluate effective public and community engagement through metrics. Particular thought should be given towards which groups the activities are targeted towards and actually delivered to, and work with hard to reach audiences rewarded. The inclusion of narrative is welcomed.

Supplementary narrative

47. The Academy agrees that it is appropriate for HEIs to provide narrative text to support the metrics in perspectives that don't currently have fully developed metrics.
48. Regarding the proposal for narrative within the public and community engagement and local growth and regeneration perspectives, the Academy welcomes the inclusion of narrative, but questions why it will not count towards assessment.
49. The Academy strongly agrees that an overarching institutional statement provided by the HEI would be helpful.
50. The Academy somewhat agrees that an overarching institutional statement provided by Research England would be helpful.
51. As stated throughout this submission, the Academy feels strongly that narrative is important to both allow the HEI to set out its KE strategy and ambitions, and highlight the transformative impact of metrics, as well as ensuring that the KEF can address the limitations of the metrics available at present.
52. Overarching institutional statements provided by HEIs would allow the institutions to set out their KE strategies, which direct and define their approaches to KE. Provision for narrative would allow HEIs' knowledge exchange strategies to be factored into the KEF and provide greater context in which to interpret the findings.

53. Institutional statements provided by Research England could provide a valuable external viewpoint of each institution.
54. The Academy feels that it is important that institutions are given the opportunity or the option to submit supplementary narratives for any or all of the perspectives. Being unable to provide contextual narrative could have the effect of stereotyping the different KE activities, and make it impossible for organisations to highlight how that particular perspective and associated metrics sit within their overall strategy. Greater inclusion of narrative could also allow the KEF to recognise and value innovative approaches to KE, which the metrics alone cannot do. This would decrease the likelihood of the KEF discouraging or disincentivising HEIs from undertaking innovative and novel forms of KE.
55. When institutions compare their strategies to those of their peers, or businesses search for a collaborator, they value specific, case-based knowledge on what activity is occurring at a particular site and how it is being executed, as opposed to broad and general metrics on that institution as a whole.

Visualisation

56. Presenting a collection of metrics in a way that is accessible to a non-specialist audience is an important aspect of the KEF, with the potential to trigger conversations among institutions, policy makers, the wider public and other stakeholders.
57. In the Academy's previous submission, we emphasised that consideration should be given to how HEIs' knowledge exchange strategies could be factored into the KEF. One approach would be to present key elements of HEIs' KE strategies as part of the final visualisation of the KEF metrics. The Academy believes that this would be straightforward to incorporate alongside the metrics without compromising the interactive online dashboards, enriching the overall final experience. This could also be applied for any narratives submitted for any of the different perspectives.
58. The Academy would also like to see an option for increased interrogation of the visualisation, including of the factors used to decide the clustering, especially discipline composition and of the individual metrics within each perspective.

Implementation

59. A pilot scheme is desirable before any new initiative or framework is implemented, and we have noted the good response to the pilot, with a diverse set of institutions involved. The Academy looks forward to the lessons and insight gained from this pilot, and how the KEF can develop to encourage the future ambition of HEIs.

Other comments

60. As noted in the commissioning letter, the framework will be focused on HEIs in England, with the other UK higher education funding bodies having the choice to utilise the framework if they choose to do so. Nevertheless, it will be important to give due regard to the incentives implemented by the UK higher education funding bodies in Scotland, Wales and Northern Ireland which already shape HEIs'

approaches to KE, such as the University Innovation Fund in Scotland. Close consultation between the UK higher education funding bodies is required.

61. The Academy believes that KE is of fundamental importance, and is therefore strongly supportive of the KEF, and of a long-term approach to developing and improving the effectiveness of UK KE activities. KE is vital to ensuring that the UK captures value, both economic and social, from its investment in research, much of which is publicly funded. Assessing KE should account for a balance of knowledge dissemination, knowledge creation and knowledge application. The KEF presents a welcome opportunity to encourage, recognise and incentivise KE, providing balance with teaching and research. Concurrent improvement of all three frameworks, including consideration of burden and coordination, should be a wider goal.