Annual Faculty Report Promoting Research Integrity

Overview

In the Faculty of Science & Engineering, individual Schools have responsibility for promoting research integrity and ensuring that UKRI Research Integrity guidelines and the UUK Concordat to Support Research Integrity are followed. In the last 12 months there has been increasing commitment to this agenda across all of our Schools, demonstrated by the creation of dedicated roles, committees and the expansion of provision and support to undergraduate and PGR students.

The Faculty has maintained an overview of these developments through our REF environment preparations. Environment statements had to describe how the Unit supports a culture of research integrity and ensures that research is conducted according to appropriate ethical, legal and professional frameworks. The Faculty led a 2-year programme of support for the development of Unit environment statements, involving briefing sessions and peer review panel sessions. These were used to emphasise the importance of this agenda and to share best practice across the Faculty. As outlined in the report, this approach helped Units to reflect on existing practices and develop future plans for further embedding research integrity and ethics.

The following Faculty report has been compiled from responses received via annual School reports, which have been completed by the Deans.

What activities are currently underway within your School's to promote Research Integrity?

School of Engineering

All academic staff in the School of Engineering have been sent the Concordat to Support Research Integrity via email and advised on good practice within research groups and awareness of the need to report any suspected cases of bad practice.

The role of the School of Engineering’s Ethics Lead (Dr Riaz Akhtar) has been expanded to include Research Integrity. Research ethics has been covered regularly at staff meetings.

Research ethics and integrity issues have continued to be shared and discussed with staff in both departments. Breakout sessions on research ethics and integrity were held at the staff away day on 16th September 2020.

School of Electrical Engineering, Electronics & Computer Science

Sharing materials to promote research integrity with Heads of Department, which are then disseminated at staff meetings and away days. At such events, research integrity is a dedicated agenda item with presentations being followed by opportunities for staff to discuss and ask questions. Embedded practices also promote research integrity.

Research integrity matters were covered in REF environment statements submitted to the School’s two Units of Assessment. The environment statements will be shared with the two departments at dedicated events in autumn 2021, where staff will have the opportunity to reflect on the statements’ reports and discuss development plans, explicitly mentioning research integrity matters.

Dr Mark Bowden (EEE) is Chair of the Faculty Ethics committee and is contributing to Faculty Management Team discussions of how to promote research ethics and integrity.
School of Physical Sciences

The preparation of draft versions of REF Environment Statements have also provided Departments with the opportunity to reflect on and review how they support a culture of research integrity, and ensure that research is conducted according to appropriate standards.

A presentation on research integrity has been delivered by the Dean to the Department of Mathematics as part of the annual Maths forum (24/9/2020) staff meetings and in both instances was followed by the opportunity for staff to discuss and ask questions. Staff were also made aware of the online Epigeum training programme on research integrity and there have been discussions as to how it can be used to create targeted training opportunities. All three Depts within the School have now received this presentation from the Dean.

Research ethics and how it applies to PhD training was delivered as part of the School induction for new PhD students. Delivered on 20th Sept 2020.

School of Environmental Sciences

Research integrity is integrated into numerous activities related to undergraduate programmes [for example via skills modules, methods and lab-based courses, field class training, and use of Turnitin for all submitted coursework], postgraduate research [for example via training provided by the Liverpool Doctoral College, ESRC CDT in Data Analytics and NWSS DTP].

Staff Engagement:

- Good data protection practice and expertise (e.g. data labs) and general participation in GDPR training
- Unconscious bias and equality and diversity training – standard, and related to REF etc.
- Ethics surgery for staff queries – Dr Jamie Goodwin White deals with requests to assist with the development of ethics statements for grant applications as well as ethics applications themselves; likewise, Dr Kathy Burrell responds to similar email requests from staff
- Large proportion of Geography and Planning staff serve as ethics reviewers for the Faculty committee – this means large proportion of active researcher staff have good working knowledge and understanding of ethics and integrity issues, and contribute to good ethical practice and a strong ethical infrastructure across the Faculty. Mark Green is the vice-chair of the Faculty committee.
- Dr Kathy Burrell is the Chair of University Central Ethics committees, and members of CORE so good representation from the School within University ethics and integrity issues - Kathy Burrell was also member of University Research Integrity Committee – until taking up role of ethics chair Jan 2018

Roger Platt, a lay member of the University Council, who chairs the Committee on Research Ethics reported back of the contribution that Dr Kathy Burrell makes. He noted that “Dr Kathy Burrell chairs one the three Central University Research Ethics Committees that review research projects with a high intrinsic risk wishing to record their appreciation for the vital role that Kathy has played during the last year in maintaining the University’s research program during the pandemic.

With the onset of the pandemic the University put in place over 40 research projects focused directly on COVID-19. These projects required rapid review to avoid any delays in mobilizing the research. Kathy played a vital role in undertaking a process that ensured that all projects were reviewed within a week, while maintaining the highest standard of rigour. Particularly noteworthy was her work on the review of the Mass Asymmetric Serial Testing in which Liverpool was taking a leading role. The constant changes in the research design required a high number of often controversial amendments, all of which Kathy dealt with very effectively to allow the project to remain on track.

Another response to the pandemic was the introduction of a specific group to review applications to conduct face-to-face research. Kathy played a key part in this process which again proved highly successful. In more general terms, Kathy has become one of our most valuable experts on research ethics. She is making a key
What future plans do you have within your Schools for promoting Research Integrity?

**School of Engineering**

We have established a working group which is looking at developing new online learning resources and assessments for students related to ethics and integrity which will aim to embed ethics/integrity throughout our Engineering degree programmes. There will be potential to build on these resources for staff-specific training with a focus on research.

A School specific policy document will be prepared for all research active staff and students in relation to reporting and dealing with suspected cases of bad practice or misconduct. This will include a flow chart covering reporting for PGR students, academic and technical staff. A template will be developed for research groups to use for providing training and supporting their group members on issues related to research integrity. We aim to release our school specific policy and reporting form to all staff by April 2022.

Research integrity will be covered at staff meetings and School Management Committees every 3 months.

**School of Electrical Engineering, Electronics & Computer Science**

The School has a research ethics lead who will continue to speak regularly about research ethics and integrity matters. This role is visible and staff are able to (and have) reached out to this lead for advice on research ethics and integrity matters.

In 2021 the School appointed a new Research Facilitator Lead who will be briefed on this report and consulted on current provision and any gaps around research integrity across the School. Consultation with the wider staff base will happen through the REF environment statement reflection with staff discussed in the item above.

Since some undergraduate and postgraduate students sometimes publish research outputs (albeit infrequently), the need may well arise to ensure that students are educated about research integrity matters. This topic, and actions arising from it, is to be discussed with the School’s newly appointed Education Facilitator Lead in the academic year 2021/22.

**School of Physical Sciences**

The finalisation of the REF environment statements has helped the departments focus on how they achieve and promote the best research environment and culture and promoting best practise in research integrity is part of that environment.

We continue to review the way we promote research integrity and ethics to our new PhD cohort during the annual school induction. This year we have a new PGR lead in the School and so will provide an additional opportunity to review this.

We have had preliminary discussions at our school equality and diversity committee as to whether we could and should introduce a School charter relating to authorship of research publications. Ideally it would provide guidance as to how early discussions around authorship could take place with the aim of clarifying expectations.

**School of Environmental Sciences**

Research Integrity is clearly a really important issue, cutting across a lot of different threads associated with our research activity- how we do our research and how we make it inclusive and ethical. Although it is integrated into much of what we already do, it is a priority of the School to focus on the issue much more explicitly. There
is an opportunity for this School to lead and contribute to ongoing social debate around justice within environmental sciences research (both for the environment and for people). Our school is particularly advantaged, as we can draw upon the expertise of the social scientists that are experts in these areas, but usually decoupled from the 'physical' scientists.

With this in mind we intend to run a School-wide Research Integrity workshop event in the coming academic year, remotely if we have to. Areas of particular focus would be the uncertainty process and the way in which the strength of evidence and agreement is brought together into the confidence and likelihood language, particularly relating to reporting from the Intergovernmental Panel for Climate Change (IPCC). We had direct experience of this as one of our colleagues, Prof. Alessandro Tagliabue, was an author of the UN commissioned IPCC report on the Oceans and Cryosphere in 2019.

Over the past few years, we have been more explicit about the role and responsibilities of PGR Progress Panels (academic staff sitting on IPAPs) and have reiterated that this is a mechanism for students to raise issues about their supervisors or project in confidence. While in theory this includes research integrity, we could be much clearer about this for both staff and students involved in progress panel interviews. For example:

- There are often comments on the IPAP forms from staff regarding the methods or approach used to explore data sets. From 2020-2021, we will ask the panel members to take responsibility in discussion this feedback with the PGR student and supervisor team, especially when concerns are raised about the approach, methods or data sources.
- We need to include some statements and signposting to research integrity in the SoES PGR handbook. At present, it is noted as a responsibility of the primary supervisor but PGRs should also be made aware that it is their responsibility too.
- We currently do not have a mechanism to effectively run IPAPs for all XJTLU students across the school. Dr Josh Dean is in the process of establishing a team in Liverpool and XJTLU to take this forward. For students supervised by staff in SOES but based elsewhere (not just XJTLU), keeping an eye on research integrity may be more of an issue at the School level. We have to trust that mechanisms are in place locally for staff and students. Josh Dean plans to bring RI into conversations when developing a process for joint IPAPs.

How is the Faculty following the **UKRI Research Integrity Assurance**?

**School of Engineering**

The School of Engineering has 4 members on the Faculty’s Ethics Committee, 2 from each department and the School of Engineering Ethics and Integrity Lead continues to be a member of the University’s Central University Ethics Committee A. Together, colleagues have built up a lot of expertise and insight into research ethics and integrity issues. This local knowledge is helping to provide support and guidance to other staff, in particular ECAs. We have also improved our staff handbook by adding further information about research ethics and integrity since the last report.

Our School has provided staff with the opportunity to have research proposals reviewed prior to submission, mentoring opportunities for all staff, and pre-publication peer review of manuscripts. There will be a mandatory requirement for proposal reviews prior to submission from the new academic year (2020/21). All of these opportunities promote good research conduct.

We have demonstrated commitment to data management and transparency through our development of COSSAN software (see the section on ‘best practice’). Data sharing is becoming common practice within the School for published studies and is encouraged by the Dean through example (see references under ‘best practice’).

**School of Electrical Engineering, Electronics & Computer Science**
The guidelines for the promotion of good research conduct cover a wide range of practices that are firmly embedded within the School’s departments.

- Ethics approval procedures are well known and used throughout the school as the ethics leads have repeatedly delivered sessions on this topic at school-level all-staff meetings, with presentation material subsequently disseminated.
- Multiple academics are members of the EPSRC peer review college and adhere to research integrity requirements when undertaking peer review for EPSRC (and other funding bodies).
- Good research conduct governance has been discussed at Faculty management meetings, with promotion of the topic filtered down to school and department level, as described above.
- Roles and responsibilities with respect to IP and ownership of research outcomes in joint projects, particularly with industrial partners, are made clear through formal contracts that the university’s Legal department assists with producing.

School of Physical Sciences

All staff are aware that they are expected to observe the highest standards of integrity, honesty and professionalism and to embed these principles in the training of junior researchers.

All research staff complete compulsory on-line training modules (GDPR and Information Security Essentials, Introduction to Diversity and Equality, Keeping Healthy, Safe and Well at UoL, Bribery Act 2010, Managing Safety at UoL, Research Ethics). As a School we are fully committed to the implementation the Concordat to Support Research Integrity for good research conduct and its governance at every career stage. All postgraduate researchers receive research integrity training through the Liverpool Doctoral College and with engagement of our PGR community with Research Integrity and Ethics starts from their induction. Through external roles as journal editors, referees and members of the EPSRC peer review college, staff observe and obey the research integrity requirements which are fundamental to those roles.

Staff are fully aware that ethical approval is required for all research and outreach activity undertaken by any staff or PGR that involves human participants and all departments in the School have staff that contribute to the review process.

School of Environment Sciences

Details of our activities that follow UKRI Research Integrity Assurance best practise have been outlined earlier.

Academic staff have a collective responsibility to endure that our undergraduate programmes adhere to policy and guidance on research integrity and can develop as exemplars of best practise. School management have oversight and ultimate responsibility to ensure that our processes are followed and improved.

For PGRs, the PI/supervisory team has additional responsibility to ensure their PhD students follow guidance and best practise.

How have the Faculty been following the latest Concordat to Support Research Integrity and its 5 Commitments?

1. Upholding the highest standards of rigour and integrity in all aspects of research
2. Ensuring that research is conducted according to appropriate ethical, legal and professional frameworks, obligations and standards
3. Supporting a research environment that is underpinned by a culture of integrity and based on good governance, best practice, and support for the development of researchers
4. Using transparent, timely, robust and fair processes to deal with allegations of research misconduct should they arise
5. Working together to strengthen the integrity of research and to review progress regularly and openly
School of Engineering

All research active staff have been provided a copy of the Concordat, and staff have been reminded about the Concordat and their responsibilities related to it through regular briefings and communications. Specifically, we have continued to follow the Concordat and its 5 commitments through:

1. Providing peer review support for research proposals and manuscripts pre-submission.
2. Ensuring that research ethics and integrity is a standing item at staff meetings and school management meetings
3. Early career academics are provided with mentoring support particularly in relation to research integrity, good practice and ethics. The scheme has recently been enhanced to ensure that independent mentors are providing stronger support for ECAs.
4. A School Wellbeing group has been established and is considering communication, environment and recognition. Transparency and expectations are covered in a ‘communications’ document which is being developed with a view to encouraging to better practices.
5. The Dean and Department Heads meet regularly with the ethics lead to review progress in relation to research ethics and integrity.

School of Electrical Engineering, Electronics & Computer Science

A strong emphasis is placed in the school on having a lively and supportive research environment and this covers all aspects of research. The environment has been developed through a suite of embedded activities, including core training and development, ethics training, core research integrity expectations, mentoring, grant proposal peer review, ECR development activities, PhD training, training for professional development review, research outputs review, promotion of equality and diversity.

In the academic year 2021/22, staff will be given a reminder of the concordat to support research integrity, which has been discussed previously in departmental staff meetings, to offer a refresh of this and ensure that all new staff members are aware of the concordat and expectations around upholding this within the School, consolidating induction information.

Allegations of research misconduct have not arisen, but if they did, managers know they are expected to implement the processes to investigate and deal with any allegations.

School of Physical Sciences

As mentioned above, all staff are aware that they are expected to observe the highest standards of integrity, honesty and professionalism and are also aware that it is their responsibility to know the rules and professional frameworks that apply to their research.

As outlined in the REF Environment Statements, all Departments have worked very hard to establish a research environment that follows best practice and supports the development of researchers.

Where allegations of research misconduct have arisen they have been addressed using transparent, timely, robust and fair processes.

School of Environment Sciences

In addition to the detailed activities outlined earlier colleagues across the School:

We provide regular peer review support for research proposals and manuscripts pre-submission, e.g. through our NERC internal Peer Review College, our Research Fellowships application and selection process and through our regular “Raising the Level” paper writing support sessions for all academics from PhD to professor.
We provide internal School-wide mentoring support to all that wish it and for all early career academics. Additionally, we have established separate formal forums for PhD students, post-doctoral researchers and early career academics and arrange cross-over networking events between them to share experience, provide support and disseminate good practise.

School Wellbeing events are in normal time running through the year under the auspices of our School Wellbeing group.

**Have you any evidence of best practise that you can share?**

**School of Engineering**

The School of Engineering has been at the forefront of demonstrating best practice in relation to Open Data through the development COSSAN. COSSAN is a cutting-edge general-purpose software designed to quantify, mitigate and manage uncertainty for risk, reliability and resilient analyses. It is released under the LGPL license, the engine can be used, modified and redistributed free of charge. It is supported by an extensive documentation and tutorials. Every year we hold training events and a bi-annual hack fest dedicated to the development of the software (https://cossan.co.uk).

Data sharing for published work is actively encouraged by the Dean (e.g. https://doi.org/10.1016/j.jsv.2018.11.041 ; https://doi.org/10.1098/rsos.191407; https://doi.org/10.1098/rsos.180082 ; https://doi.org/10.1098/rsos.180687).

The School of Engineering Ethics Lead also sits on the Central University Ethics Committee A hence widening the experience and exposure of ethical issues beyond that at a School/Department level.

**School of Electrical Engineering, Electronics & Computer Science**

Staff make use of the open publishing service arXiv. Many staff members also make their code freely available via popular software repository providers such as github. Use of arXiv and open software access continues to be adopted in the school.

Members of the school have contributed to the development of standards and professional frameworks to ensure the ethical use of AI in autonomous systems and robotics (as reported in REF 2021 environment submissions).

**School of Physical Sciences**

We have had preliminary discussions at our school equality and diversity committee as to whether we could and should introduce a School charter relating to authorship of research publications. Ideally it would provide guidance as to how early discussions around authorship could take place with the aim of clarifying expectations.

**School of Environmental Sciences**

A recent example of best practise has been developed within the Ocean Sciences research group with the writing of a 'postdoctoral contract'. The idea is to be more explicit about the expectations around PDRAs, for both the PDRA and the PI. This was motivated by some specific conversations with current and past PDRAs and prior experiences where the expectations (that are currently not codified anywhere) were not understood in the same way by PDRA and PI. The following is a DRAFT version:

**Postdoctoral Contract**

If you are to take up a position and a postdoctoral researcher within the Oceans Sciences research group, you assured of the following undertakings from the permanent staff:
● Your line manager or supervisor will agree clear goals and objectives for you to focus on during your contract. These will be updated annually.

● You will be encouraged to allocate up to 20% of your time (one day per week) to your own independent research interests

● You will be provided with a mentor appropriate to your career goals and aspirations. This will be reviewed annually and adjusted if necessary.

● Your line manager or supervisor will make funds available (or help you seek funding) for professional development in line with your career goals and aspirations

● Your line manager or supervisor will help you develop collaborations via their own networks and by supporting your participation in national and international meetings as appropriate

● You will have an annual Performance and Development Review with your line manager or supervisor, which will reflect on achievements, plan future activity and review your goals and objectives, as well as training and support needs