University College Dublin

REVIEW GROUP REPORT

Periodic Quality Review

UCD School of Chemistry

June 2022

Accepted by the UCD Governing Authority at its meeting of 15 December 2022

Table of Contents

Summary Findings of the Review Group

The Review Group has identified a number of key findings in relation to areas of good practice operating within the School and areas which the Review Group would highlight as requiring future improvement. The main section of this Report sets out all observations, commendations, and recommendations of the Review Group in more detail. A list of all commendations and recommendations is set out in Appendix 1.

Please note that the numbers below refer to the relevant paragraph in the body of the Report.

Examples of Good Practice

The Review Group identified a number of commendations, in particular:

2.6 The School (and its leadership) is to be warmly commended for maintaining its high-quality research and high-quality teaching and student support during the exceptionally difficult conditions of the COVID-19 pandemic. Both undergraduate and postgraduate students were very enthusiastic and complimentary about the quality and supportiveness of the academic staff; this was also recognised as a strength by university management.

4.12 The contribution of the School to teaching outside of its own degree programmes – in particular, the support for other degree programmes in UCD as well as the summer schools with students from the USA and China – is exemplary, and it should be acknowledged that this places a large burden on both technical and teaching staff but this also provides the financial basis for supporting the School's activities from hiring staff to maintaining excellent research equipment.

10.2 Engagement of staff with university activities outside the School, and more widely outside UCD, is varied and impressive: examples include learned society committee work, a range of EU research networks and a Centre for Doctoral Training with Nottingham, and secondary schools' outreach and public engagement work.

Recommendations for Future Improvement

The Review Group would suggest that the following three recommendations be prioritised:

3.12 Academic Workloads**:** One of the main findings of the Review Group is that the academic staff are struggling with high administrative and teaching workloads. The high (and rising) student:staff ratio creates not only high teaching loads, but also a high administrative workload associated with teaching management. These issues are particularly associated with large cohorts of non-chemistry specialists in the earlier stages of their degrees who require 'service' teaching, with management of such large cohorts resulting in a particularly high administrative overhead which is in addition to the substantial administrative jobs already given to relatively junior academic staff. Fortunately, the solution to this is clear: the high amount of service teaching is generating a financial surplus, some of which needs to be used to (i) expand the academic staff complement, and (ii) increase administrative provision which would be a cost-effective way of saving staff time. An increase in the academic staff complement will have the knock-on benefit of increasing the School's critical mass in research terms too. Review and

consolidation of the large number of modules with small student enrolments (29/87 with <10 students in 2020-21) should also be undertaken to keep teaching workloads under control.

3.20 Cohesion/ 'Community Spirit': It came across to the Review Group very clearly that staff are concerned about a loss of social cohesion and a feeling of community in recent years. Of course, much of this has come from the isolation of working from home during the pandemic. The lack of day-to-day interactions between colleagues – and in particular the loss of the staff common room which provided an obvious focus – is keenly felt and has consequences in tangible things such as fewer research collaborations and jointly-managed PhD students, and more intangible things such as loss of 'community spirit'. Addressing this will require a concerted, pro-active effort to fix in terms of community / team-building / social activities. Post-doctoral researchers who have come from outside the School have been particularly isolated and significant effort needs to be made to ensure that they are well integrated into the school community.

5.5 Curriculum Review and Quality Assurance**:** The Review Group recommends that the School undertakes a review of its curriculum. This could include standardising procedures for annual programme quality review including integration of student feedback from module ratings, the annual student surveys for undergraduate, graduate taught and research students, external examiner reports and staff student Undergraduate / Postgraduate Fora into programme plans for forthcoming academic year. A from-first-principles look at both the curriculum content and its organisation and teaching delivery methods would be timely, especially coming out of the pandemic with fresh knowledge about how on-line methods can be judiciously used. The School should develop a mechanism to support in-school discussions and collaborations on Teaching and Learning (e.g. brown-bag lunches, seminars on Teaching and Learning, scheduled meetings to discuss cross module alignment).

1. Introduction and Overview of the School

Introduction

1.1 This report presents the findings of the Periodic Quality Review of the UCD School of Chemistry, University College Dublin, which was undertaken in March 2022.

The Review Framework

1.2 Irish Universities have collectively agreed a framework for their quality review and quality improvement systems, which is consistent with both the legislative requirements of the *Qualifications and Quality Assurance (Education and Training) Act 2012*, and international good practice (e.g. *Standards and Guidelines for Quality Assurance in the European Higher Education Area, 2015*). Quality reviews are carried out in academic, administrative and support service units.

1.3 The purpose of Periodic Quality Review is to assist the University to assure itself of the quality of each of its constituent units, and to utilise learning from this developmental process in order to effect improvement, including:

- To monitor the quality of the student experience, and of teaching and learning.
- To monitor research activity, including management of research activity; and assessing the research performance with regard to research productivity, research income, and recruiting and supporting doctoral students.
- To identify, encourage and disseminate good practice, and to identify challenges and how to address these.
- To provide an opportunity for units to test the effectiveness of their systems and procedures for monitoring and enhancing quality and standards.
- To encourage the development and enhancement of these systems, in the context of current and emerging provision.
- To inform the University's strategic planning process.
- The output report provides robust evidence for external accreditation bodies.
- The process provides an external benchmark on practice and curriculum.
- To provide public information on the University's capacity to assure the quality and standards of its awards. The University's implementation of its quality procedures enables it to demonstrate how it discharges its responsibilities for assuring the quality and standards of its awards, as required by the *Universities Act 1997* and the *Qualifications and Quality Assurance (Education and Training) Act 2012*.

The Review Process

1.4 Typically, the review model comprises four major elements:

- Preparation of a Self-Assessment Report (SAR);
- A visit by a Review Group that includes UCD staff and external experts, both national and international. The site visit normally will take place over a two or three day period;
- Preparation of a Review Group Report that is made public;
- Agreement of an action plan for improvement (Quality Improvement Plan) based on the Review Group Report's recommendations. The University will also monitor progress against the Quality Improvement Plan.

Full details of the review process can be found on the UCD Quality Office website: www.ucd.ie/quality.

The Review Group

1.5 The composition of the Review Group for the UCD School of Chemistry review was as follows:

- Professor Catherine Blake, UCD School of Public Health, Physiotherapy and Sports Science (Chair)
- Professor Kevin Denny, UCD School of Economics (Deputy Chair)
- Professor Melanie Cooper, Michigan State University (Extern)
- Professor Mike Ward, University of Warwick (Extern)

1.6 Due to restrictions introduced in response to the COVID-19 virus, the Review Group undertook a virtual site visit of the School between 7th to 11th March 2022 and held meetings with the College Principal; Head of School; SAR Co-ordinating Committee; Academic, Administrative, Technical and Research staff in the School; undergraduate and postgraduate students; and other University staff working in the College of Science and support units which interact with the School. The review site visit schedule is included as Appendix 3.

1.7 In addition to the Self-Assessment Report, the Review Group considered documentation provided by the School and the University during the site visit.

1.8 This Review Group Report has been read and approved by all members of the Review Group.

Preparation of the Self-Assessment Report (SAR)

1.9 Following a briefing from the UCD Quality Office in April 2021, a Self-Assessment Report Coordinating Committee (SARCC) was established to prepare the Self-Assessment Report (SAR). The SARCC was representative of the key groupings within the School and included a Postgraduate Research student.

1.10 The SARCC met on five occasions in 2021: 26 October, 3 November, 18 November (sub-groups), 24 November 2021 and 22 December. In addition, the School held a town hall meeting for all staff on 21 February 2022; the review was a standing item at two academic staff meetings (11 May 2021 and 9 November 2021) and sub-committees participated in other activities that supported the development of material for the SAR.

1.11 Additional information to assist with the development of the Self-Assessment Report was provided to the School by a number of units within the University, including the UCD Office for Institutional Research.

1.12 The final Self-Assessment Report was sent to the UCD Quality Office on 22 February 2022, and the associated appendices were sent on 28 February 2022.

The University

1.13 University College Dublin (UCD) is a large and diverse university whose origins date back to 1854. The University is situated on a large modern campus about 4 km to the south of the centre of Dublin.

1.14 The University Strategic Plan, Rising to the Future, 2020 to 2024, states that the University's mission is: "to contribute to the flourishing of Dublin, Ireland, Europe and the world through the excellence and impact of our research and scholarship, the quality of our graduates and our national and global engagement; providing a supportive community in which every member of the University is enabled to achieve their full potential".

1.15 The University is currently organised into six Colleges and 37 Schools:

- UCD College of Arts and Humanities
- UCD College of Business
- UCD College of Engineering and Architecture
- UCD College of Health and Agricultural Sciences
- UCD College of Social Sciences and Law
- UCD College of Science

1.16 As one of the largest universities on the island of Ireland, UCD supports a broad, deep and rich academic community in Science, Business, Engineering, Health Sciences, Agriculture, Veterinary Medicine, Arts, Law, Celtic Studies and Human Sciences. There are currently more than 26,000 students in our UCD campus (approximately 16,300 undergraduates, 7,800 postgraduates and 2,200 Occasional and Adult Education students) registered on over 70 University degree programmes, including over 6,300 international students from more than 121 countries. The University also has over 5,400 students studying UCD degree programmes on campuses overseas.

UCD School of Chemistry

1.17 The School of Chemistry is one of seven Schools that comprise the UCD College of Science. The School has a long and distinguished history of research and teaching and moved from the city centre to its current site in UCD Science Centre South on the Belfield campus in 1964.

1.18 The School currently comprises 25 full-time academic staff, 3 administrative staff, and 11 Technical / Specialist staff. Recruitment of four additional and one replacement academic staff, and three technical staff, is in progress so that a complement of 29 academic and 14 technical staff should be achieved by the beginning of the 2022-2023 academic year. The affiliated

Research Centre, the Centre for BioNano Interactions has three additional research funded support staff, who are included in the School.

1.19 The School offers five undergraduate programmes and contributes to the provision of many other programmes in Science and other Colleges. It also offers three Graduate Taught MSc programmes and offers modules to its research students as a part of a structured PhD programme. It has a typical BSc graduating class size of 55-65 in recent years.

1.20 It is a research-intensive School with a typical complement of 85-100 postgraduate research students and 10-20 post-doctoral fellows, housed in state-of-the-art research facilities. Research activities are supported by several School-funded suites of instruments (Nuclear Magnetic Resonance, Mass Spectrometry, etc.) and by School-funded research demonstratorships (PhD students with a significant responsibility for supporting undergraduate laboratory teaching).

1.21 The School of Chemistry's mission is as follows: The School is committed to providing taught programmes and carrying out research of the highest quality, as measured by international standards, being directed towards the fundamental search for knowledge and understanding, while at the same time being actively engaged with society and supporting economic growth and development.

2. Organisation and Management

General Comments and Context

2.1 The School is one of seven in the College of Science and the School's interests are represented by the Head of School at the College of Science Executive. In addition, members of academic staff represent the School at College level on the Undergraduate and Graduate Teaching Programme and Exam Boards and various other College committees. The School is represented by the Head of School at University-level committees, such as Academic Council, the Extended Leadership Group, and the Heads of School Forum.

2.2 The overall structure of the School, including its committee structure, is clear and logical, with chairs of School committees reporting into the School Executive Committee, although communication structures between different elements of the School need to be enhanced. As is traditional in Chemistry, the School is organised into three 'sections': Inorganic, Organic and Biological, and Physical for the organisation of teaching, curriculum development, teaching allocation, review of assessments and liaison with the relevant external examiner. While the sections do not have formal standing, each has a 'Head of Section'. As identified by the SAR, this structure has the strength that it brings together experts in the three broad areas to discuss and organise crucial aspects of teaching, learning and assessment. There is a risk, however, of the different areas developing as 'silos' within the School.

2.3 The School has engaged constructively with this Periodic Quality Review and most of the stakeholders associated with the School have contributed directly to the preparation of the SAR. The Review Group was pleased to have the opportunity to meet and have productive dialogue with so many of these people using a wholly online process.

2.4 The School has, in recent years, developed an Academic Workload Allocation Model, with a transparent methodology for recording teaching workload, administrative contributions, and indicative data on research activity for the 2020-21 academic year. This is being implemented for 2021-22. Challenges with change management are acknowledged.

2.5 The Review Group was provided with evidence that indicated that many of the problems that staff encountered and have identified stemmed from high workloads, relating to teaching quantities, a high administrative load associated with routine teaching management, and use of staffing resources. For example, not deploying teaching specialists, and not having enough administrative staff where they could be more usefully utilised, is creating a false economy in which academic staff time is not used most effectively.

Commendations

2.6 The School (and its leadership) is to be warmly commended for maintaining its high-quality research and high-quality teaching and student support during the exceptionally difficult conditions of the COVID-19 pandemic. Both undergraduate and postgraduate students were very enthusiastic and complimentary about the quality and supportiveness of the academic staff; this was also recognised as a strength by university management.

2.7 In 2021, the School engaged in an organisational review, with a revision of the School Committee structure. There has been a commitment to distribute the workload of committee chairs and membership more equitably across the faculty. Both GDPR and Global Engagement Committees have been established to further the School's governance and focus on internationalisation.

2.8 The School has a now well-established Equality, Diversity and Inclusion committee, which contributed to the successful application for the Athena Swan Bronze Award and is tasked with implementation of the School's Gender Equality Action Plan.

2.9 Chairs of School committees are encouraged to keep documents in a shared drive, ensuring open and transparent school decision-making.

Recommendations

2.10 Internal Communications: There is a challenge with cohesion between staff within the School: the pandemic has negatively impacted further on communication and removed opportunities for informal day-to-day interactions. The Review Panel recommends (i) a review of formal communication channels, with the development of a communication plan for the School to ensure that information is disseminated among all members of the school community; and (ii) establishment of an action plan to re-establish social events and other informal interactions between colleagues.

2.11 Continued Organisation Review: The Review Group recommends that the School continues the current organisational review, standardising terms of reference and meeting schedules of various School standing committees. The School should also ensure that representation in committee memberships is considered, in accordance with the Gender Equality Action Plan, but also to include research staff/postdoctoral researchers/early career researchers where appropriate.

2.12 Post-Doctoral Staff Support: The Review Group recommends that the School establishes a community of practice/peer forum for post-doctoral researchers, including social aspects, mentoring, personal / professional skills development, pastoral care.

2.13 Student Engagement: The School should re-establish the Undergraduate and Postgraduate Fora as standard, to engage with students, facilitating an important mechanism for student input to their programmes and the School (see also Recommendation 5.6).

2.14 Workload: The School should continue to implement and refine the academic workload model and workload allocation as a matter of priority (in tandem with rationalisation of teaching workloads through curriculum and assessment review) to ensure equitable allocation of workloads taking into account where staff are in their career paths.

3. Staff and Facilities

General Comments and Context

3.1 The School had 62 staff as of December 2021, including 25 faculty, 16 technical/support and 21 employed through research funding. Overall 33.9% identified as female and 64.5% identified as male, but the Female:Male ratio varies between staff groupings; 20:80 for faculty and 25:75 for support staff in contrast with 57:31 for research funded staff. It is notable that progress is being made with the Athena Swan and Gender Equality Action Plan.

3.2 The faculty complement has increased from 19 to 24, from 2014 -2021. The School is to be congratulated for its success in recruitment through the *Ad Astra* Fellowship scheme and the imminent appointment of a female Professor through the HEA Strategic Academic Leadership Initiative (SALI). Technical staff numbers have overall remained stable, while research staff numbers have seen a decline in this 2014-2021 period. It is noted that three further technical posts were approved for recruitment at the time of the SAR report.

3.3 As evident from the staff age profile, there will be planned retirements over the coming years in the faculty and technical groups, so succession and timely planning for replacements will be important.

3.4 Past challenges to stability and capacity within the administrative team of the School, due to frequent staff turnover and delays in filling vacancies, are well recognised. The establishment of a permanent School Manager position from 2019 and the current administrative complement of three FTE staff members in the School Office are welcome.

3.5 The SAR outlines staff induction procedures at the level of the School, highlighting that specialised training for new staff and induction to procedures specific to the research, teaching, and administrative activities of the School have been lacking. The creation of a school-level resource has commenced, and the Staff Handbook is being updated. UCD HR does not provide specific induction / onboarding or training for new support staff. Thus, on-the-job learning is the primary means of induction, which can be challenging for any new staff.

3.6 Staff training, development and promotion pathways and opportunities within UCD vary between staff groups. Training for technical staff requires in-house or externally accessed training. The absence of personal promotion opportunities for administrative staff is recognised.

3.7 The Review Group heard evidence of a lack of mentoring, particularly for technical staff and early career researchers and teachers.

3.8 Since 2014, the School has been located in a newly constructed section of the UCD Science Centre. There are excellent laboratory teaching and research facilities, with a range of high quality instrumentation. However, the Review Group heard that there is a lack of a communal staff space for the School. The repair and replacement of ageing equipment and planning for its recurrent replacement was also highlighted as a required action point.

Commendations

3.9 The School proposal to assign new academic staff a mentor, and to formalise and strengthen this support, during the probationary period (2 years) is positive, as is the proposal for gradual progression to allocation to full teaching-loads and administrative responsibilities.

3.10 Both undergraduate and postgraduate students were very enthusiastic and complimentary about the quality and supportiveness of the academic staff; this was also recognised as a strength by university management. The *Ad Astra* scheme, supported by the University, is an excellent way to support early career researchers and help them into a permanent academic career and the School has benefited from this scheme.

3.11 Labs and instrument facilities were felt to be excellent, with instrumental facilities enjoying expert technical staff support and management, and both the institution and the department being responsive to requests for instrumentation. The School has been refurbished recently with excellent laboratory space.

Recommendations

3.12 Academic Workloads: One of the main findings of the Review Group is that the academic staff are struggling with high administrative and teaching workloads. The high (and rising) student:staff ratio creates not only high teaching loads, but also a high administrative workload associated with teaching management. These issues are particularly associated with large cohorts of non-chemistry specialists in the earlier stages of their degrees who require 'service' teaching, with management of such large cohorts resulting in a particularly high administrative overhead which is in addition to the substantial admin jobs already given to relatively junior academic staff. Fortunately, the solution to this is clear: the high amount of service teaching is generating a financial surplus, some of which needs to be used to (i) expand the academic staff complement, and (ii) increase administrative provision which would be a cost-effective way of saving staff time. An increase of the academic staff complement will have the knock-on benefit of increasing the School's critical mass in research terms too. Review and consolidation of the large number of modules with small student enrolments (29/87 modules with <10 students in 2020-21) should also be undertaken to keep teaching workloads under control.

3.13 Use of Teaching Specialists: The Review Group observed that the University seems to have a very negative attitude towards academic teaching specialists, giving them only fixed-term positions with no career development, thus making this a very unattractive type of position. Yet, in a school where teaching loads are very high (and student recruitment is set to increase), and there are some outstanding research specialists who do little or no teaching, some teaching specialists would be obviously valuable.

3.14 Deployment of Teaching Specialists: The Review Group believes that there are several areas where the School would strongly benefit from being allowed to make teaching-focussed appointments. Firstly: some of the relatively routine, high-volume service teaching could be devolved to teaching specialists. Secondly: the large amount of laboratory teaching would benefit from oversight by a dedicated teaching laboratory specialist with a remit to look horizontally across the various modules to ensure proper integration of lab skills within a year group (Note: a coherent programme of lab-based skills development is a key part of the curriculum in its own right and need not be subservient to the classroom content of a particular

module). Thirdly: the School is heavily over-reliant on PhD students to do a lot of teaching-lab demonstrating, which is neither desirable nor sustainable, and indeed unreasonable if PhD students are also supervising undergraduate project students in the research labs. Employment of dedicated laboratory-based teaching staff would ease strains elsewhere. The Review Group notes that judicious use of such teaching specialists is quite common internationally across the HE sector for example in the UK and the US.

3.15 Administrative Staff Complement: The complement of administrative staff (three) is small for a school of this size and complexity. Some administrative functions that departments in other universities might manage themselves are, in the UCD structure, met at College level (e.g. provision of internships, student support); but it remains clear that a significant amount of routine administration and management of teaching, associated in particular with large student cohorts, is devolved to academic staff (see also Recommendation 3.12). This is a poor use of resources.

3.16 Mentorship / Career Development: Mentorship (long-term, beyond initial induction) was raised as an issue by academic staff, administrative staff, and members of the post-doctoral community. Members of the technical staff mentioned that they found it difficult to access information about development opportunities which is particularly important for them as they can only get promotion by moving to a new role or substantially expanding their skill sets. The Review Group recommends that the School uses the *Performance for Growth* (P4G) mechanism as an opportunity for identifying and determining staff training needs.

3.17 Facilities – Instrumentation: The Review Group heard that a clear source of frustration is that some of the School's excellent equipment has been in a state of disrepair for extended periods which is hampering the progress of many research projects. It is not cost-effective to leave valuable instrumentation inoperable when so many people need it: instruments that are either broken or not currently supported include X-ray diffraction, SQUID magnetometry, EPR and Raman spectrometers. The budget appears to exist and so the Review Group recommends that these facilities should be fixed as a matter of urgency: it was commented many times that facilities for organic chemistry are first class but it is the rest that are suffering. Furthermore, the Review Group endorses the School's view, as stated in Chapter 7 of the SAR, that "Due to the increased complexity of laboratory repair/service, it is recommended that a building representative be assigned within the School of Chemistry to liaise/communicate and, importantly, track and ensure that repair cases are dealt with accordingly".

3.18 Facilities – Lab Space: Whilst the infrastructure and facilities attracted praise there emerged a clear need for a transparent, fair and responsive process to allocate laboratory space which needs to be seen as not 'belonging' to a particular 'owner' but instead needs to be allocated dynamically in response to the changing needs of research groups. An early career researcher in the School pointed out a delay of two years in getting research lab space sorted out; another complained about the fact that their PhD students have no desk space when there is an empty office nearby used by someone whose group has shrunk and thus the space is not efficiently used. An annual space audit / allocation process is required to ensure both equity and efficiency in the utilization of space.

3.19 Facilities – Other Schools and Colleges: Access to workshops or instrumental facilities in other schools was reported as being slow, difficult, expensive and time-consuming. This is something for management to consider at (probably) college level: internal financial barriers need to be

removed, so that someone from the School of Chemistry who needs access to, for example, facilities in another school can do so without undue problems. This would ensure best use of university resources. The SAR does suggest that a charging model is being developed which would help with this issue but it is clearly not yet fully functional.

3.20 Cohesion / 'Community Spirit': It came across to the panel very clearly that staff are concerned about a loss of social cohesion and a feeling of community in recent years. Of course much of this has come from the isolation of working from home during the pandemic. The lack of day-to-day interactions between colleagues – and in particular the loss of the staff common room which provided an obvious focus – is keenly felt and has consequences in tangible things such as fewer research collaborations and jointly-managed PhD students, and more intangible things such as loss of 'community spirit'. Addressing this will require a concerted, proactive effort to fix in terms of community / team-building / social activities. Post-doctoral researchers who have come from outside the School have been particularly isolated and significant effort needs to be made to ensure that they are well integrated into the school community.

3.21 School Staff Space: The Review Group recommends that the School explores, with UCD College of Science and UCD Estates, the potential for a dedicated social space where school staff can congregate to enhance communication and collaboration.

4. Teaching, Learning and Assessment

General Comments and Context

4.1 The School delivers four undergraduate degree programmes; Chemistry (CHEM), Medicinal Chemistry and Chemical Biology (MCCB), Chemistry with Biophysical Chemistry (BioP) and Chemistry with Environmental and Sustainable Chemistry (ESC), and is significantly involved in a further cross-school BSc programme - Chemistry, Mathematics & Education. Students' progress to these programmes, having completed stage 1 and 2 of the DN200 Science degree programme. The total student numbers enrolled in the final year of the School's BSc degrees is in the region of 50-65 per annum over the past four years (see SAR Appendix 4.1).

4.2 There is a large commitment to Chemistry teaching for the undergraduate programmes and majors in Science and also to majors in other schools (e.g Medicine, Engineering, Agriculture). There is also a strong programme delivering dedicated modules to freshman students from Northeastern University (ca 100 y1), and summer schools to US and Chinese students. These early stage modules provide the majority (70%) of the student FTE income to the School.

4.3 There are high numbers of students in early stage modules, with a large commitment to traditional laboratory practicals. This creates repetition of teaching sessions and pressure on limited laboratory time and resources. There is further anticipated demand for undergraduate Chemistry teaching in non-school Majors. Meanwhile, the SAR highlighted that co-ordination and administration of these large cohort service modules represents a significant workload for individual colleagues, which is not fully taken account of in the workload model. Much of the administrative work in these modules could be more efficiently carried out if there was a dedicated resource to design and coordinate these stage 1 modules. Thus, resourcing and innovative teaching and learning solutions are required within the short to medium term (see Recommendations 3.12 and 3.13).

4.4 The School delivers three taught MSc programmes; Chemistry through Negotiated Learning (NL), Nanomaterials Chemistry (Nano) and Synthetic Chemistry for the Pharmaceutical and Fine Chemicals Industry (SYN). There is relatively small enrolment in these taught masters programmes with a total of 17 student FTEs in 2021 (School Profile Report, March 2021), although there appears to have been growth in 2021/22 (see SAR Appendix 4.1). It was also noted in the SAR that over 30 modules are provided to the graduate school / taught MSc students.

4.5 Further exploration of the 2021 School Profile Report, indicated that one third (29/87) of all school modules had 10 or less students enrolled, and almost 20% (17/87) had < 5 students. These modules were exclusively at level 4 and 5. Such a high level of module administration for small numbers of students can only add to the staff workload burden.

4.6 The School has a representative Teaching and Learning committee, chaired by the School Head of Teaching and Learning and attended by those with specific programme directorship or co-ordination responsibilities. It is not so clear how the practice of teaching and learning enhancement and a cycle of curricular review is fostered through the whole School, within and across the sections.

4.7 The College of Science Teaching and Learning Committee is chaired by a member of the School (College of Science Vice-Principal for Teaching and Learning) and they act on the University Teaching and Learning Committee, the University Management Team Education Group and various subgroups of these.

4.8 The Review Group heard from several individuals that the teaching has been quite traditional without attention to the most recent innovations in Chemistry pedagogy and a culture of not discussing or reflecting on teaching and learning issues was prevalent, particularly during the pandemic. The School was aware of this and there is clearly an appetite for change, particularly in light of commendation 4.10 below.

Commendations

4.9 Both undergraduate and postgraduate students were highly satisfied with the quality and supportiveness of the teaching staff, including during the COVID-19 pandemic and its aftermath.

4.10 It is very positive to see that two staff have attained, and two are currently enrolled in the Professional Certificate in Teaching and Learning. A member of the School was awarded an Academic Fellowship in Teaching and Academic Development, while awards in Teaching and Learning from the College of Science have included school staff among the recipients. The success of some staff in attaining funding for Teaching and Learning related research and development projects has led to new developments in undergraduate lab experiments, enquiry-based learning and the development of an academic advisory strategy for incoming science students.

4.11 The process for annual review of student feedback ratings from the University Module Feedback surveys and the commitment to take action if ratings are less than acceptable, is to be commended.

4.12 The contribution of the School to teaching outside of its own degree programmes – in particular, the support for other degree programmes in UCD as well as the summer schools with students from the USA and China – is exemplary, and it should be acknowledged that this places a large burden on both technical and teaching staff but also this provides the financial basis for supporting the School's activities from hiring staff to maintaining excellent research equipment.

Recommendations

4.13 Resourcing of Teaching: Given that undergraduate student numbers are expected to grow, increasing further the teaching and administration responsibilities of senior demonstrators is not a reasonable option. This kind of large-enrolment teaching environment requires specialized staff who are able to devote themselves full time to the development, assessment and organization of the modules. The Review Group therefore recommends that the School considers its approach to the use of teaching specialists (see also Recommendations 3.13 and 3.14).

4.14 Module Review: The Review Group recommends that the School reviews the module content, lecture and laboratory schedules across the School, to ensure effectiveness, efficiency and consistency of module workload for students and staff.

4.15 Laboratory Teaching Review: The Review Group recommends that the School reviews the evidence from the research literature about the most effective use of laboratory time (for example, see https://pubs.acs.org/doi/10.1021/acs.jchemed.8b00874). Currently, each module also contains a laboratory component, which may or may not be necessary. There is little evidence that traditional laboratories improve student learning of disciplinary content, yet there are a number of important skills and scientific practices that are difficult to teach any other way. The School will probably come under increased pressure to justify the use of laboratory time. Having evidence to support the productive ways that laboratory work helps students learn will be needed. As part of this review, the School should also consider whether the current three-hour lab model is optimal given the demands on lab space and difficulties arising from timetabling which are likely to increase as student numbers rise. This links to part of Recommendation 3.13 about having a laboratory teaching specialist to ensure integration of material and to make best use of lab experiments across a year group.

4.16 Assessment: The Review Group recommends that the School maps assessment strategies across modules within stages and programmes to equitably spread, diversify and, where necessary, reduce the burden of assessment for students and staff.

4.17 Staff Engagement in Teaching and Learning: The School should develop mechanisms to support and encourage staff to engage in teaching and learning enrichment activities: for example, to promote staff to enrol in the UCD Teaching and Learning certificates and diplomas that will help energise Teaching and Learning pedagogy and embed universal design and innovation in module/programme delivery. The School should begin a programme of in-School discussions and collaborations on Teaching and Learning matters (brown-bag lunches, seminars on Teaching and Learning, scheduled meetings to discuss cross module alignment). The School should also develop and support a mentoring system for new faculty as they engage in Teaching and Learning.

4.18 Teaching Evaluation: The School should develop an equitable approach to the evaluation of teaching that involves more than student feedback: possibly including peer review, peer discussions, and – perhaps most importantly – annual reflections on teaching. While evaluation of one's teaching by others can be helpful, improvements in teaching are more likely to come from a reflective process in which we consider what worked, and what changes could be made to improve outcomes.

4.19 Teaching and Learning Innovation: The Review Group believes that some of the innovations adopted during COVID have the potential to improve teaching and learning in the post-COVID years and recommends that now is the time for the School to explore use of e-learning and asynchronous learning, building on these innovations to more efficiently use available laboratory and classroom hours, and to improve student learning. It will be essential to identify and follow evidence-based practices as some in-person instruction is migrated to online (synchronous and asynchronous) teaching. The Review Group notes that there is only one Educational Technology support person for the College, but there are other resources available. The Review Group also notes that this process will be personnel- and time- intensive, which has implications for staff workload (i.e. moving instruction online should be adequately addressed in workload models).

4.20 Education Research: The School should consider how a core staff member who is engaged in discipline-based education research (DBER) might be integrated into the School. There were

several discussions about the “traditional” approach to teaching in the School, and it may be time to consider how evidence-based pedagogies can be integrated across all aspects of instruction. For example, see the recommendations of the US National Academies report on DBER (see https://www.nap.edu/catalog/13362/discipline-based-education-research-understanding-and-improving-learning-in-undergraduate).

5. Curriculum Development and Review

General Comments and Context

5.1 The Review Group heard of the growth in demand for the undergraduate major in Medicinal Chemistry and Chemical Biology (MCCB). This trend shifts the burden onto colleagues in medicinal chemistry and chemical biology. The relatively low numbers enrolled to three of the BSc majors is striking and the Review Group endorses the SAR's recommendation to consider a cost-benefit analysis. The plan for a review of the School's undergraduate offerings is timely and important.

5.2 Staff involved in Teaching and Learning in the School expressed the view that it is time for a curriculum review. There is a general perception that there is over-assessment, and in particular, individual modules being silos with a lack of connections across modules within a year group. A fresh look is needed to ensure horizontal and vertical alignment of the curriculum across the programme stages.

5.3 The Review Group heard that the reduction in staff cohesion during the pandemic has resulted in an environment where teaching issues are rarely discussed between colleagues.

Commendations

5.4 The Review Group notes that there is good engagement with graduate research students in the Graduate Student Survey, expressing high levels of satisfaction with research skills.

Recommendations

5.5 Curriculum Review and Quality Assurance: The Review Group recommends that the School undertakes a review of its curriculum. This could include standardising procedures for annual programme quality review including integration of student feedback from module ratings, the annual student surveys for undergraduate, graduate taught and research students, external examiner reports and staff student Undergraduate / Postgraduate Fora into programme plans for forthcoming academic year. A from-first-principles look at both the curriculum content and its organisation and teaching delivery methods would be timely, especially coming out of the pandemic with fresh knowledge about how on-line methods can be judiciously used. The School should develop a mechanism to support in-school discussions and collaborations on Teaching and Learning (e.g. brown-bag lunches, seminars on Teaching and Learning, scheduled meetings to discuss cross module alignment).

5.6 Student Feedback: The Review Group observed that the 'Student voice' opportunities and consultations have got lost during the pandemic and need active management to restart them. The Review Group recommends that the Undergraduate and Postgraduate Fora should be re-established as a priority and clear lines of communication between undergraduate or taught graduate students and their programme or stage directors set out. The results of the Student Survey should be considered in the periodic scheduled curriculum reviews of the programmes. Students highlighted the drop-in support (e.g. tutorials) from Y1/Y2 to Y3: they feel inhibited from 'pestering' staff too much. In contrast, examples of 'active learning' in the form of workshops/problem-solving integrated into thermodynamics lectures were particularly praised.

5.7 Rationalisation of Modules and Small Programmes: There are many (29/87) small modules with <10 people (ref School Profile Report March 2021). Running these may not be cost effective, especially given the obvious high workload concerns, and these need a critical re-evaluation / cost-benefit analysis. The same applies to taught masters programmes with small enrolments and it is important that the planned review of the School's undergraduate offerings is progressed as a priority.

5.8 Growth in the Medicinal Chemistry / Chemical Biology Major: There was considerable concern about the increase in the numbers of students choosing the degree programme that includes medicinal and biological chemistry. If this growth continues the School will need to determine how students' capstone experience will be handled, since there will not be enough laboratory space for them all and it will place a large burden on academic staff working in those areas. Is there a possibility to substitute an internship experience? Or can students work in the research laboratories in another school? Is this an area where new academic appointments can be prioritised? The School should address these important questions.

5.9 Loss of Identity for Medicinal Chemistry / Chemical Biology Students: Several students mentioned that they take a significant number of their upper-level modules from other schools. This may lead to assumptions by staff that all students have taken a previous module (when they have not), and that all students in that module belong to that major. The Review Group recommends that the School reaches out to other schools to help them understand that there are a large number of Chemistry students on those modules who may have had different backgrounds from their own students.

6. Research Activity

General Comments and Context

6.1 The SAR presented a thorough review of the strengths, weaknesses, opportunities and threats to research activity in the School, with insightful recommendations for quality improvement.

6.2 Most of the School faculty are research active. Several School staff are affiliated with research centres: Centre for BioNano Interactions (CBNI), Centre for Synthesis & Chemical Biology (CSCB), Bioeconomy SFI Research Centre (BiOrbic) and Science Foundation Ireland Research Centre for Pharmaceuticals (SSPC), with some staff holding directorships of these research centres.

6.3 There is a large number (~100) of postgraduate research students in the School, with a consequent high volume of supervisory panels and a high student:faculty ratio. Thus it may be challenging to manage regular Research Studies Panel meetings and to ensure consistency in the processes and procedures required by the UCD Graduate School.

Commendations

6.4 The Review Group commends the School on the fact that there are some outstanding and clearly highly successful research groups with internationally leading reputations, and outstanding track records of grant income and generation of high quality publications.

6.5 The Review Group notes that there is a strong identity with and strong support of Research Students by principal supervisor/PI within research groups.

6.6 The Review Group observed that the staff survey and SWOT analysis was thorough and realistic. The School already has set out a number of actions to support research and to enhance research quality, particularly with respect to increasing the quality / impact of published outputs from some research groups.

Recommendations

6.7 Research Culture: Whilst there are some well-established and successful groups, the landscape in the School is very asymmetric with some small / struggling groups and an increase in low-impact publications (a sign of pressure to 'publish or perish'). This is partly a consequence of workloads and the staffing changes suggested elsewhere in this report should help here. However, the School does not have a clear research strategy with research groups generally operating in isolation, and the panel particularly noted a feeling that research efforts are isolated in individual groups with little culture of collaboration and very few jointly-supervised PhD students on genuinely collaborative projects compared to the disciplinary norm. The biggest grants these days go to large teams rather than individual researchers. The Review Group recommends that the School should do some active planning around identifying and promoting collaborative opportunities between academic staff. Regular conversations about how the School can support people in reaching their goals and objectives in relation to research output should also take place. Other possibilities include:

- Explicit efforts to establish more collaborations (research 'away day' / speed-dating sessions; support and advice from central research office about what possibilities are / horizon scanning; some PhD studentships reserved for collaborative two-supervisor projects; a recruitment strategy that brings in colleagues who are keen to collaborate with existing staff).
- Re-balance workload allocations by mutual agreement to limit expectations for research outputs from those with high teaching / admin loads.
- Consider provision of sabbaticals, based on the standard UCD scheme which appears not to be in operation in the School.
- Reduce the reliance on PhD students for high-volume lab teaching; this is linked to the earlier recommendation regarding appointment of dedicated teaching staff (see Recommendation 3.13) and is also highlighted as a problem in the SAR.

6.8 Research Students: The School should review implementation of the University Graduate School requirements, with standardisation of Research Studies Panel procedures and meetings. Students seem to have limited interaction with their panel members, relying on their principal supervisor for oversight of their progress. The ratings on the Graduate Research Survey also suggest a gap in career development opportunities for PhD students. Suggestions for enhancement include: allocation of specific roles for panel members to support the holistic development of the student, more explicit consideration of student career development in the Research Studies Panel, more diverse Research Studies Panel membership to support students, perhaps consider external collaborators on Research Studies Panels and industry placements to increase student exposure to external networks. The Review Group also recommends a review and consultation with research students on their needs in respect of orientation, information and communication with their peers and the staff.

7. Management of Quality and Enhancement

General Comments and Context

7.1 The SAR presented evidence regarding oversight of quality in several areas. For research, these include indicators of quality of research outputs and assurance for health and safety. In education, quality enhancement includes student feedback, external monitoring of undergraduate and postgraduate programmes.

7.2 Excellence in student performance in the School's taught and research programmes is evidenced by a number of medals and prizes.

7.3 The Review Group noted that there have been several staff who have completed, or are in the process of completing, the University's Professional Certificate in Teaching and Learning (see 4.10 and 4.17), which demonstrates the attention being paid to the quality of teaching in the School. Staff have also demonstrated an interest and a willingness to engage in curriculum review, and other teaching and learning enhancement activities (see 5.3 and 4.17).

Commendations

7.4 The Review Group observed that there is strong evidence of external review and oversight of the School programmes, with three appointed external examiners, one each for Organic, Inorganic and Physical Chemistry.

7.5 Safety is a priority in the structure of the School, with the Safety Committee reporting to the School Executive Committee.

7.6 Two of the School's four undergraduate degrees (BSc Chemistry and BSc MCCB) are accredited by the Royal Society of Chemistry.

Recommendations

7.7 Safety: The School should ensure that there is a more consistent approach to safety between research groups, with the School Safety Committee empowered to enforce University safety rules and procedures.

8. Support Services

General Comments and Context

8.1 The School has frequent interactions with support units around the University, such as HR, the Library, SIRC, UCD Estates, IT services as well as other UCD schools and in general it seems to be positive about its experience despite some obvious COVID-induced challenges. The School has a good appreciation of the work of the various services which are often under significant pressure. There were however expressions of frustration in the SAR with some services notably regarding the administrative processes around recruitment of post-doctoral researchers. More recently hired academics in the School, less familiar with UCD procedures, were particularly adversely affected. It was also noted that there was some duplication whereby laboratory maintenance is either accessed through contact with UCD Estates or through the College of Science, where the decision on who is to be contacted is essentially based on previous engagement and not through a standard protocol.

8.2 A related problem when dealing with support services is undocumented or unknown changes in support unit policies. The School's facilities including instrumentation are used by colleagues in other UCD schools. However as new staff are recruited, it is likely that there will be increased demand for space in the Science South building and this will present a challenge. The SAR noted that the School administrative staff were better able to resolve these administrative interactions with support units.

8.3 The School has strong, effective, and well-managed interactions with other academic Schools in respect of both teaching provision and research collaborations. These are well-summarised in the SAR.

Commendations

8.4 The School has nimbly reacted to the various challenges produced by COVID and the increased demand for its resources.

8.5 The School intends to address some of the frustrations noted in 8.1 (including the administrative processes around recruitment of post-doctoral researchers) with more formalised mentorship and additional documentation.

8.6 The School is considering a unified booking system for use of instrumentation.

Recommendations

8.7 Share Internal Knowledge of Standard Procedures: The School should identify where there are communication difficulties in relation to research and HR support units, particularly in relation to the recruitment of post-doctoral research staff. The Review Group recommends that the School develops a central repository of common administrative information about administrative procedures to enable staff members to work through the various processes more effectively. This could be compiled into a number of handbooks which would be made available to everyone in the School.

8.8 Enhance Liaison with HR: The Review Group recommends that there is enhanced liaison with the College of Science's HR Partner. This should assist the School in planning its recruitment strategy.

8.9 Administration: The Review Group recommends that the School ensures it has sufficient administrative capacity to ensure that routine administrative interactions with support units are efficiently processed.

8.10 Enhance Liaison with UCD Services: The Review Group recommends that the School should consider the appointment of a member of staff to liaise with external University services in relation to equipment replacement and repairs (see Recommendation 3.17) to ensure that there are minimal delays (see also Recommendations 3.18 and 3.19 with respect to instrumentation, workshops and laboratories).

9. Collaborative Educational Provision

General Comments and Context

9.1 Collaborative educational provision features in the School's huge contribution to the Chemistry curricular needs of other degree programmes and in the Summer School programme.

9.2 The School is a partner in the Dublin Chemistry programme, a postgraduate collaboration, established with Trinity College Dublin in 2006. This programme supports advanced training and includes a range of modules/courses run in both universities. Currently 80 of the 94 graduate research students in the School are enrolled in this programme. The range of modules at postgraduate level provided by UCD Chemistry is clearly broad, but there are small enrolments in many modules. This does not appear to be an efficient use of stretched School resources.

9.3 In 2021, the School has, in partnership with the University of Nottingham, started a Centre for Doctoral Training (CDT) titled *Atoms-to-Products - an Integrated Approach to Sustainable Chemistry* as part of the SFI-funded BiOrbic Research Centre. The funding is for five cohort intakes of five students each.

Commendations

9.4 The Review Group commends the School for its significant contribution to other valuable majors in UCD, across many disciplines.

9.5 The Review Group commends the School for the successful postgraduate collaborative education in the Dublin Chemistry Programme and the new doctoral programme with University of Nottingham.

9.6 The School delivers a successful Summer School directed at students from overseas, specifically the USA and China.

Recommendations

9.7 The Review Group recommends that the School ensures that the workload associated with these collaborative educational initiatives is considered in the workload allocation model to support the activities with appropriate staffing.

9.8 The School should ensure that resources are adequately deployed to be able to meet the curricular needs of the other undergraduate majors, as well as the Chemistry majors.

9.9 The School should develop the identity of students on the School's Medicinal Chemistry and Chemical Biology major, in collaboration with the other schools from which their core modules are delivered.

9.10 The School should review the range of modules at postgraduate level provided by the School within the context of the collaborative programmes. The offerings are clearly broad, but the enrolment numbers to individual modules are small. While the choice provided to students is

commendable, this must be balanced with efficient deployment of staff resources (see Recommendation 5.7).

9.11 The School should progress plans to actively engage with UCD Global in relation to international student recruitment.

10. External Relations

General Comments and Context

10.1 The School and its staff are engaged in a wide variety of external interactions, both within and outside the University. These include (to quote from the SAR) *"roles on College and University Committees, interactions with research collaborators and academic visitors, journal editors, national and international professional and learned societies, undergraduate and postgraduate external examiners, grant agencies, international students and student recruitment agencies, employers, alumni, philanthropists, secondary school staff and students, industry clients for contract chemical analyses, chemical and equipment suppliers."* All of the types of external interaction that one would expect to see form a successful and active chemistry department are present. It was noted however that participation of staff in such external activities is not evenly balanced.

Commendations

10.2 Engagement of staff with university activities outside the School, and more widely outside UCD, is varied and impressive: examples include learned society committee work, a range of EU research networks and a Centre for Doctoral Training with Nottingham, and secondary schools outreach and public engagement work.

10.3 The School is to be commended on its engagement in outreach activities to secondary schools and participation in Young Scientist Competition and UCD Science Day.

10.4 The School staff demonstrate a high level of participation in national and international research networks. The wide range of research collaborations both within the EU and further afield underpins some of the School's research output.

10.5 Some national prizes / awards, and other international accolades, are noteworthy accomplishments.

10.6 There is a good level of engagement of staff with professional and learned society activities, including conference organisation and management.

10.7 A particularly active programme of seminars and annual symposia spanning the range from international plenary speakers to flash presentations for early career researchers is in place.

Recommendations

10.8 <u>External Engagement</u>: The Review Group heard that communication with outside units (*e.g.* industry, potential employers) is not as strong as it could be. The School should therefore explore possible engagement with industry, including in relation to co-supervision of research students, and the imminent curriculum review: an external advisory board might be productive.

10.9 <u>Recognition of External Contributions</u>: The School should take account of external commitments in the workload allocation model.

10.10 Website: The School's website needs to be updated as a priority. Currently, news headline items date from 2019. The research day information is from 2018. Information to attract applicants on to undergraduate / postgraduate courses is basically a wall of text. The Review Group recommends that a makeover from a digital marketing expert, and some fresh content (particularly graphics, videos) are needed.

APPENDIX 1

UCD School of Chemistry – Full List of Commendations and Recommendations

This appendix contains a full list of all commendations and recommendations made by the Review Group for the UCD School of Chemistry and should be read in conjunction with the specific chapters above.

Please note that the paragraph references below refer to the relevant paragraphs in the report text.

Organisation and Management

Commendations

2.6 The School (and its leadership) is to be warmly commended for maintaining its high-quality research and high-quality teaching and student support during the exceptionally difficult conditions of the COVID-19 pandemic. Both undergraduate and postgraduate students were very enthusiastic and complimentary about the quality and supportiveness of the academic staff; this was also recognised as a strength by university management.

2.7 In 2021, the School engaged in an organisational review, with a revision of the School Committee structure. There has been a commitment to distribute the workload of committee chairs and membership more equitably across the faculty. Both GDPR and Global Engagement Committees have been established to further the School's governance and focus on internationalisation.

2.8 The School has a now well-established Equality, Diversity and Inclusion committee, which contributed to the successful application for the Athena Swan Bronze Award and is tasked with implementation of the School's Gender Equality Action Plan.

2.9 Chairs of School committees are encouraged to keep documents in a shared drive, ensuring open and transparent school decision-making.

Recommendations

2.10 Internal Communications: There is a challenge with cohesion between staff within the School: the pandemic has negatively impacted further on communication and removed opportunities for informal day-to-day interactions. The Review Panel recommends (i) a review of formal communication channels, with the development of a communication plan for the School to ensure that information is disseminated among all members of the school community; and (ii) establishment of an action plan to re-establish social events and other informal interactions between colleagues.

2.11 Continued Organisation Review: The Review Group recommends that the School continues the current organisational review, standardising terms of reference and meeting schedules of various School standing committees. The School should also ensure that representation in committee memberships is considered, in accordance with the Gender Equality Action Plan, but also to include research staff/postdoctoral researchers/early career researchers where appropriate.

2.12 Post-Doctoral Staff Support: The Review Group recommends that the School establishes a community of practice/peer forum for post-doctoral researchers, including social aspects, mentoring, personal / professional skills development, pastoral care.

2.13 Student Engagement: The School should re-establish the Undergraduate and Postgraduate Fora as standard, to engage with students, facilitating an important mechanism for student input to their programmes and the School (see also Recommendation 5.6).

2.14 Workload: The School should continue to implement and refine the academic workload model and workload allocation as a matter of priority (in tandem with rationalisation of teaching workloads through curriculum and assessment review) to ensure equitable allocation of workloads taking into account where staff are in their career paths.

Staff and Facilities

Commendations

3.9 The School proposal to assign new academic staff a mentor, and to formalise and strengthen this support, during the probationary period (2 years) is positive, as is the proposal for gradual progression to allocation to full teaching-loads and administrative responsibilities.

3.10 Both undergraduate and postgraduate students were very enthusiastic and complimentary about the quality and supportiveness of the academic staff; this was also recognised as a strength by university management. The Ad Astra scheme, supported by the University, is an excellent way to support early career researchers and help them into a permanent academic career and the School has benefited from this scheme.

3.11 Labs and instrument facilities were felt to be excellent, with instrumental facilities enjoying expert technical staff support and management, and both the institution and the department being responsive to requests for instrumentation. The School has been refurbished recently with excellent laboratory space.

Recommendations

3.12 Academic Workloads: One of the main findings of the Review Group is that the academic staff are struggling with high administrative and teaching workloads. The high (and rising) student:staff ratio creates not only high teaching loads, but also a high administrative workload associated with teaching management. These issues are particularly associated with large cohorts of non-chemistry specialists in the earlier stages of their degrees who require 'service' teaching, with management of such large cohorts resulting in a particularly high administrative overhead which is in addition to the substantial admin jobs already given to relatively junior academic staff. Fortunately, the solution to this is clear: the high amount of service teaching is generating a financial surplus, some of which needs to be used to (i) expand the academic staff complement, and (ii) increase administrative provision which would be a cost-effective way of saving staff time. An increase of the academic staff complement will have the knock-on benefit of increasing the School's critical mass in research terms too. Review and consolidation of the large number of modules with small student enrolments (29/87 modules with <10 students in 2020-21) should also be undertaken to keep teaching workloads under control.

3.13 Use of Teaching Specialists: The Review Group observed that the University seems to have a very negative attitude towards academic teaching specialists, giving them only fixed-term positions with no career development, thus making this a very unattractive type of position. Yet, in a school where teaching loads are very high (and student recruitment is set to increase), and there are some outstanding research specialists who do little or no teaching, some teaching specialists would be obviously valuable.

3.14 Deployment of Teaching Specialists: The Review Group believes that there are several areas where the School would strongly benefit from being allowed to make teaching-focussed appointments. Firstly: some of the relatively routine, high-volume service teaching could be devolved to teaching specialists. Secondly: the large amount of laboratory teaching would benefit from oversight by a dedicated teaching laboratory specialist with a remit to look horizontally across the various modules to ensure proper integration of lab skills within a year group (Note: a coherent programme of lab-based skills development is a key part of the curriculum in its own right and need not be subservient to the classroom content of a particular module). Thirdly: the School is heavily over-reliant on PhD students to do a lot of teaching-lab demonstrating, which is neither desirable nor sustainable, and indeed unreasonable if PhD students are also supervising undergraduate project students in the research labs. Employment of dedicated laboratory-based teaching staff would ease strains elsewhere. The Review Group notes that judicious use of such teaching specialists is quite common internationally across the HE sector for example in the UK and the US.

3.15 Administrative Staff Complement: The complement of administrative staff (three) is small for a school of this size and complexity. Some administrative functions that departments in other universities might manage themselves are, in the UCD structure, met at College level (e.g. provision of internships, student support); but it remains clear that a significant amount of routine administration and management of teaching, associated in particular with large student cohorts, is devolved to academic staff (see also Recommendation 3.12). This is a poor use of resources.

3.16 Mentorship / Career Development: Mentorship (long-term, beyond initial induction) was raised as an issue by academic staff, administrative staff, and members of the post-doctoral community. Members of the technical staff mentioned that they found it difficult to access information about development opportunities which is particularly important for them as they can only get promotion by moving to a new role or substantially expanding their skill sets. The Review Group recommends that the School uses the Performance for Growth (P4G) mechanism as an opportunity for identifying and determining staff training needs.

3.17 Facilities – Instrumentation: The Review Group heard that a clear source of frustration is that some of the School's excellent equipment has been in a state of disrepair for extended periods which is hampering the progress of many research projects. It is not cost-effective to leave valuable instrumentation inoperable when so many people need it: instruments that are either broken or not currently supported include X-ray diffraction, SQUID magnetometry, EPR and Raman spectrometers. The budget appears to exist and so the Review Group recommends that these facilities should be fixed as a matter of urgency: it was commented many times that facilities for organic chemistry are first class but it is the rest that are suffering. Furthermore, the Review Group endorses the School's view, as stated in Chapter 7 of the SAR, that "Due to the increased complexity of laboratory repair/service, it is recommended that a building

representative be assigned within the School of Chemistry to liaise/communicate and, importantly, track and ensure that repair cases are dealt with accordingly".

3.18 Facilities – Lab Space: Whilst the infrastructure and facilities attracted praise there emerged a clear need for a transparent, fair and responsive process to allocate laboratory space which needs to be seen as not 'belonging' to a particular 'owner' but instead needs to be allocated dynamically in response to the changing needs of research groups. An early career researcher in the School pointed out a delay of two years in getting research lab space sorted out; another complained about the fact that their PhD students have no desk space when there is an empty office nearby used by someone whose group has shrunk and thus the space is not efficiently used. An annual space audit / allocation process is required to ensure both equity and efficiency in the utilization of space.

3.19 Facilities – Other Schools and Colleges: Access to workshops or instrumental facilities in other schools was reported as being slow, difficult, expensive and time-consuming. This is something for management to consider at (probably) college level: internal financial barriers need to be removed, so that someone from the School of Chemistry who needs access to, for example, facilities in another school can do so without undue problems. This would ensure best use of university resources. The SAR does suggest that a charging model is being developed which would help with this issue but it is clearly not yet fully functional.

3.20 Cohesion / 'Community Spirit': It came across to the panel very clearly that staff are concerned about a loss of social cohesion and a feeling of community in recent years. Of course much of this has come from the isolation of working from home during the pandemic. The lack of day-to-day interactions between colleagues – and in particular the loss of the staff common room which provided an obvious focus – is keenly felt and has consequences in tangible things such as fewer research collaborations and jointly-managed PhD students, and more intangible things such as loss of 'community spirit'. Addressing this will require a concerted, proactive effort to fix in terms of community / team-building / social activities. Post-doctoral researchers who have come from outside the School have been particularly isolated and significant effort needs to be made to ensure that they are well integrated into the school community.

3.21 School Staff Space: The Review Group recommends that the School explores, with UCD College of Science and UCD Estates, the potential for a dedicated social space where school staff can congregate to enhance communication and collaboration.

Teaching, Learning and Assessment

Commendations

4.9 Both undergraduate and postgraduate students were highly satisfied with the quality and supportiveness of the teaching staff, including during the COVID-19 pandemic and its aftermath.

4.10 It is very positive to see that two staff have attained, and two are currently enrolled in the Professional Certificate in Teaching and Learning. A member of the School was awarded an Academic Fellowship in Teaching and Academic Development, while awards in Teaching and Learning from the College of Science have included school staff among the recipients. The success of some staff in attaining funding for Teaching and Learning related research and

development projects has led to new developments in undergraduate lab experiments, enquiry-based learning and the development of an academic advisory strategy for incoming science students.

4.11 The process for annual review of student feedback ratings from the University Module Feedback surveys and the commitment to take action if ratings are less than acceptable, is to be commended.

4.12 The contribution of the School to teaching outside of its own degree programmes – in particular, the support for other degree programmes in UCD as well as the summer schools with students from the USA and China – is exemplary, and it should be acknowledged that this places a large burden on both technical and teaching staff but also this provides the financial basis for supporting the School's activities from hiring staff to maintaining excellent research equipment.

Recommendations

4.13 Resourcing of Teaching: Given that undergraduate student numbers are expected to grow, increasing further the teaching and administration responsibilities of senior demonstrators is not a reasonable option. This kind of large-enrolment teaching environment requires specialized staff who are able to devote themselves full time to the development, assessment and organization of the modules. The Review Group therefore recommends that the School considers its approach to the use of teaching specialists (see also Recommendations 3.13 and 3.14).

4.14 Module Review: The Review Group recommends that the School reviews the module content, lecture and laboratory schedules across the School, to ensure effectiveness, efficiency and consistency of module workload for students and staff.

4.15 Laboratory Teaching Review: The Review Group recommends that the School reviews the evidence from the research literature about the most effective use of laboratory time (for example, see https://pubs.acs.org/doi/10.1021/acs.jchemed.8b00874). Currently, each module also contains a laboratory component, which may or may not be necessary. There is little evidence that traditional laboratories improve student learning of disciplinary content, yet there are a number of important skills and scientific practices that are difficult to teach any other way. The School will probably come under increased pressure to justify the use of laboratory time. Having evidence to support the productive ways that laboratory work helps students learn will be needed. As part of this review, the School should also consider whether the current three-hour lab model is optimal given the demands on lab space and difficulties arising from timetabling which are likely to increase as student numbers rise. This links to part of Recommendation 3.13 about having a laboratory teaching specialist to ensure integration of material and to make best use of lab experiments across a year group.

4.16 Assessment: The Review Group recommends that the School maps assessment strategies across modules within stages and programmes to equitably spread, diversify and, where necessary, reduce the burden of assessment for students and staff.

4.17 Staff Engagement in Teaching and Learning: The School should develop mechanisms to support and encourage staff to engage in teaching and learning enrichment activities: for example, to

promote staff to enrol in the UCD Teaching and Learning certificates and diplomas that will help energise Teaching and Learning pedagogy and embed universal design and innovation in module/programme delivery. The School should begin a programme of in-School discussions and collaborations on Teaching and Learning matters (brown-bag lunches, seminars on Teaching and Learning, scheduled meetings to discuss cross module alignment). The School should also develop and support a mentoring system for new faculty as they engage in Teaching and Learning.

4.18 Teaching Evaluation: The School should develop an equitable approach to the evaluation of teaching that involves more than student feedback: possibly including peer review, peer discussions, and – perhaps most importantly – annual reflections on teaching. While evaluation of one's teaching by others can be helpful, improvements in teaching are more likely to come from a reflective process in which we consider what worked, and what changes could be made to improve outcomes.

4.19 Teaching and Learning Innovation: The Review Group believes that some of the innovations adopted during COVID have the potential to improve teaching and learning in the post-COVID years and recommends that now is the time for the School to explore use of e-learning and asynchronous learning, building on these innovations to more efficiently use available laboratory and classroom hours, and to improve student learning. It will be essential to identify and follow evidence-based practices as some in-person instruction is migrated to online (synchronous and asynchronous) teaching. The Review Group notes that there is only one Educational Technology support person for the College, but there are other resources available. The Review Group also notes that this process will be personnel- and time- intensive, which has implications for staff workload (i.e. moving instruction online should be adequately addressed in workload models).

4.20 Education Research: The School should consider how a core staff member who is engaged in discipline-based education research (DBER) might be integrated into the School. There were several discussions about the "traditional" approach to teaching in the School, and it may be time to consider how evidence-based pedagogies can be integrated across all aspects of instruction. For example, see the recommendations of the US National Academies report on DBER (see https://www.nap.edu/catalog/13362/discipline-based-education-research-understanding-and-improving-learning-in-undergraduate).

Curriculum Development and Review

Commendations

5.4 The Review Group notes that there is good engagement with graduate research students in the Graduate Student Survey, expressing high levels of satisfaction with research skills.

Recommendations

5.5 Curriculum Review and Quality Assurance: The Review Group recommends that the School undertakes a review of its curriculum. This could include standardising procedures for annual programme quality review including integration of student feedback from module ratings, the annual student surveys for undergraduate, graduate taught and research students, external examiner reports and staff student Undergraduate / Postgraduate Fora into programme plans for forthcoming academic year. A from-first-principles look at both the curriculum content and

its organisation and teaching delivery methods would be timely, especially coming out of the pandemic with fresh knowledge about how on-line methods can be judiciously used. The School should develop a mechanism to support in-school discussions and collaborations on Teaching and Learning (e.g. brown-bag lunches, seminars on Teaching and Learning, scheduled meetings to discuss cross module alignment).

5.6 Student Feedback: The Review Group observed that the 'Student voice' opportunities and consultations have got lost during the pandemic and need active management to restart them. The Review Group recommends that the Undergraduate and Postgraduate Fora should be re-established as a priority and clear lines of communication between undergraduate or taught graduate students and their programme or stage directors set out. The results of the Student Survey should be considered in the periodic scheduled curriculum reviews of the programmes. Students highlighted the drop-in support (e.g. tutorials) from Y1/Y2 to Y3: they feel inhibited from 'pestering' staff too much. In contrast, examples of 'active learning' in the form of workshops/problem-solving integrated into thermodynamics lectures were particularly praised.

5.7 Rationalisation of Modules and Small Programmes: There are many (29/87) small modules with <10 people (ref School Profile Report March 2021). Running these may not be cost effective, especially given the obvious high workload concerns, and these need a critical re-evaluation / cost-benefit analysis. The same applies to taught masters programmes with small enrolments and it is important that the planned review of the School's undergraduate offerings is progressed as a priority.

5.8 Growth in the Medicinal Chemistry / Chemical Biology Major: There was considerable concern about the increase in the numbers of students choosing the degree programme that includes medicinal and biological chemistry. If this growth continues the School will need to determine how students' capstone experience will be handled, since there will not be enough laboratory space for them all and it will place a large burden on academic staff working in those areas. Is there a possibility to substitute an internship experience? Or can students work in the research laboratories in another school? Is this an area where new academic appointments can be prioritised? The School should address these important questions.

5.9 Loss of Identity for Medicinal Chemistry / Chemical Biology Students: Several students mentioned that they take a significant number of their upper-level modules from other schools. This may lead to assumptions by staff that all students have taken a previous module (when they have not), and that all students in that module belong to that major. The Review Group recommends that the School reaches out to other schools to help them understand that there are a large number of Chemistry students on those modules who may have had different backgrounds from their own students.

Research Activity

Commendations

6.4 The Review Group commends the School on the fact that there are some outstanding and clearly highly successful research groups with internationally leading reputations, and outstanding track records of grant income and generation of high quality publications.

6.5 The Review Group notes that there is a strong identity with and strong support of Research Students by principal supervisor/PI within research groups.

6.6 The Review Group observed that the staff survey and SWOT analysis was thorough and realistic. The School already has set out a number of actions to support research and to enhance research quality, particularly with respect to increasing the quality / impact of published outputs from some research groups.

Recommendations

6.7 Research Culture: Whilst there are some well-established and successful groups, the landscape in the School is very asymmetric with some small / struggling groups and an increase in low-impact publications (a sign of pressure to 'publish or perish'). This is partly a consequence of workloads and the staffing changes suggested elsewhere in this report should help here. However, the School does not have a clear research strategy with research groups generally operating in isolation, and the panel particularly noted a feeling that research efforts are isolated in individual groups with little culture of collaboration and very few jointly-supervised PhD students on genuinely collaborative projects compared to the disciplinary norm. The biggest grants these days go to large teams rather than individual researchers. The Review Group recommends that the School should do some active planning around identifying and promoting collaborative opportunities between academic staff. Regular conversations about how the School can support people in reaching their goals and objectives in relation to research output should also take place. Other possibilities include:

- Explicit efforts to establish more collaborations (research 'away day' / speed-dating sessions; support and advice from central research office about what possibilities are / horizon scanning; some PhD studentships reserved for collaborative two-supervisor projects; a recruitment strategy that brings in colleagues who are keen to collaborate with existing staff).
- Re-balance workload allocations by mutual agreement to limit expectations for research outputs from those with high teaching / admin loads.
- Consider provision of sabbaticals, based on the standard UCD scheme which appears not to be in operation in the School.
- Reduce the reliance on PhD students for high-volume lab teaching; this is linked to the earlier recommendation regarding appointment of dedicated teaching staff (see Recommendation 3.13) and is also highlighted as a problem in the SAR.

6.8 Research Students: The School should review implementation of the University Graduate School requirements, with standardisation of Research Studies Panel procedures and meetings. Students seem to have limited interaction with their panel members, relying on their principal supervisor for oversight of their progress. The ratings on the Graduate Research Survey also suggest a gap in career development opportunities for PhD students. Suggestions for enhancement include: allocation of specific roles for panel members to support the holistic development of the student, more explicit consideration of student career development in the Research Studies Panel, more diverse Research Studies Panel membership to support students, perhaps consider external collaborators on Research Studies Panels and industry placements to increase student exposure to external networks. The Review Group also recommends a review and consultation with research students on their needs in respect of orientation, information and communication with their peers and the staff.

Management of Quality and Enhancement

Commendations

7.4 The Review Group observed that there is strong evidence of external review and oversight of the School programmes, with three appointed external examiners, one each for Organic, Inorganic and Physical Chemistry.

7.5 Safety is a priority in the structure of the School, with the Safety Committee reporting to the School Executive Committee.

7.6 Two of the School's four undergraduate degrees (BSc Chemistry and BSc MCCB) are accredited by the Royal Society of Chemistry.

Recommendations

7.7 Safety: The School should ensure that there is a more consistent approach to safety between research groups, with the School Safety Committee empowered to enforce University safety rules and procedures.

Support Services

Commendations

8.4 The School has nimbly reacted to the various challenges produced by COVID and the increased demand for its resources.

8.5 The School intends to address some of the frustrations noted in 8.1 (including the administrative processes around recruitment of post-doctoral researchers) with more formalised mentorship and additional documentation.

8.6 The School is considering a unified booking system for use of instrumentation.

Recommendations

8.7 Share Internal Knowledge of Standard Procedures: The School should identify where there are communication difficulties in relation to research and HR support units, particularly in relation to the recruitment of post-doctoral research staff. The Review Group recommends that the School develops a central repository of common administrative information about administrative procedures to enable staff members to work through the various processes more effectively. This could be compiled into a number of handbooks which would be made available to everyone in the School.

8.8 Enhance Liaison with HR: The Review Group recommends that there is enhanced liaison with the College of Science's HR Partner. This should assist the School in planning its recruitment strategy.

8.9 Administration: The Review Group recommends that the School ensures it has sufficient administrative capacity to ensure that routine administrative interactions with support units are efficiently processed.

8.10 Enhance Liaison with UCD Services: The Review Group recommends that the School should consider the appointment of a member of staff to liaise with external University services in relation to equipment replacement and repairs (see Recommendation 3.17) to ensure that there are minimal delays (see also Recommendations 3.18 and 3.19 with respect to instrumentation, workshops and laboratories).

Collaborative Provision

Commendations

9.4 The Review Group commends the School for its significant contribution to other valuable majors in UCD, across many disciplines.

9.5 The Review Group commends the School for the successful postgraduate collaborative education in the Dublin Chemistry Programme and the new doctoral programme with University of Nottingham.

9.6 The School delivers a successful Summer School directed at students from overseas, specifically the USA and China.

Recommendations

9.7 The Review Group recommends that the School ensures that the workload associated with these collaborative educational initiatives is considered in the workload allocation model to support the activities with appropriate staffing.

9.8 The School should ensure that resources are adequately deployed to be able to meet the curricular needs of the other undergraduate majors, as well as the Chemistry majors.

9.9 The School should develop the identity of students on the School's Medicinal Chemistry and Chemical Biology major, in collaboration with the other schools from which their core modules are delivered.

9.10 The School should review the range of modules at postgraduate level provided by the School within the context of the collaborative programmes. The offerings are clearly broad, but the enrolment numbers to individual modules are small. While the choice provided to students is commendable, this must be balanced with efficient deployment of staff resources (see Recommendation 5.7).

9.11 The School should progress plans to actively engage with UCD Global in relation to international student recruitment.

External Relations

Commendations

10.2 Engagement of staff with university activities outside the School, and more widely outside UCD, is varied and impressive: examples include learned society committee work, a range of EU research networks and a Centre for Doctoral Training with Nottingham, and secondary schools outreach and public engagement work.

10.3 The School is to be commended on its engagement in outreach activities to secondary schools and participation in Young Scientist Competition and UCD Science Day.

10.4 The School staff demonstrate a high level of participation in national and international research networks. The wide range of research collaborations both within the EU and further afield underpins some of the School's research output.

10.5 Some national prizes / awards, and other international accolades, are noteworthy accomplishments.

10.6 There is a good level of engagement of staff with professional and learned society activities, including conference organisation and management.

10.7 A particularly active programme of seminars and annual symposia spanning the range from international plenary speakers to flash presentations for early career researchers is in place.

Recommendations

10.8 External Engagement: The Review Group heard that communication with outside units (*e.g.* industry, potential employers) is not as strong as it could be. The School should therefore explore possible engagement with industry, including in relation to co-supervision of research students, and the imminent curriculum review: an external advisory board might be productive.

10.9 Recognition of External Contributions: The School should take account of external commitments in the workload allocation model.

10.10 Website: The School's website needs to be updated as a priority. Currently, news headline items date from 2019. The research day information is from 2018. Information to attract applicants on to undergraduate / postgraduate courses is basically a wall of text. The Review Group recommends that a makeover from a digital marketing expert, and some fresh content (particularly graphics, videos) are needed.

APPENDIX 2

UCD School of Chemistry
Response to the Review Group Report

Composing the Self-assessment Report was a valuable reflective exercise, during which the School evaluated its current position from a number of perspectives, reflecting on our strengths and opportunities, identifying areas of good practice and evaluating weaknesses and challenges in a systematic way. There was a high level of engagement from all staff categories and from the student community, both in compiling the Self-assessment Report and in interacting with the Review Group during the site visit.

The Review Group Site Visit was a positive and constructive experience and we thank the Group for their supportive engagement, their insightful analysis and their helpful Report. We welcome the endorsement of the Review Group for our activities through commendations and will carefully consider the recommendations during the Quality Improvement Planning process.

We are formulating a plan to address the recommendations in the Quality Review Report, and several actions are already underway. These include updating and enhancing our workload model; instituting a systematic, structured approach to mentoring of new staff, putting in place a comprehensive system for monitoring adherence to policy in relation to Research Study panels, and the preparation of a policy for space allocation in the School. These changes, and many other plans for improvement, will significantly benefit the School and its outputs.

With specific reference to the prioritised recommendations identified by the Review Group, the School's initial proposals/comments are outlined below:

(i) Academic Workloads: The Review Group recommends actions to address the finding that academic staff are struggling with high administrative and teaching workloads.

Proposal/Comment: The School acknowledges this as a serious issue and will take a number of actions, including (i) to utilise its strong budget position and UCD/HEA supports to increase the number of academic staff (the number should increase by three during the next academic year), (ii) to capitalise on the increased number of Technical Officers available to support undergraduate teaching to ease the administrative burden on module coordinators, and (iii) to conduct a review of its modules and majors to identify offerings that are not sustainable.

(ii) Cohesion / 'Community Spirit': The Review Group recommends a concerted pro-active effort to fix the loss of social cohesion in terms of community / team-building / social activities.

Proposal/Comment: A number of actions are being taken to address the deterioration in 'community spirit', including (i) social gatherings have been resumed, e.g. with the reinstatement of the traditional end-of-year dinner for the academic staff with the external examiners, (ii) plans for the restoration of a School 'common room' / seminar room are included in the proposals for refurbishment of the Science Centre, and (iii) a postgraduate & postdoctoral 'forum' will be instituted and there will be greater representation of postgrads and postdocs on School committees.

(iii) Curriculum Review and Quality Assurance: The Review Group recommends that the School undertakes a review of its curriculum.

Proposal/Comment: A curriculum review will be carried out in the next academic year. Planning is underway for an 'away day' in September in which academic and relevant support staff will discuss (i) the learning objectives and curriculum for our lab components and (ii) how to carry out a full curriculum review and a review of the majors offered by the School. In advance, a meeting of relevant staff will share experiences and good practice in the delivery and assessment of the large modules, which absorb so much of our energy, and in which many changes have been made in response to the pandemic. A more formal procedure for annual curriculum oversight and review will be drafted and we will resuscitate the undergraduate 'forum' to ensure that feedback from students is obtained each trimester.

Within three months of receiving the Review Group Report, the School will prepare a Quality Improvement Plan (QIP) outlining how it proposes to implement the Report recommendations. The QIP will be agreed with the College Principal and signed-off by the Chair of the Review Group and the Director of Quality. The QIP will be considered by the UCD Academic Council Committee on Quality and then published alongside the Review Group Report.

One year after the QIP has been accepted, a Progress Review meeting will be convened by the Registrar and Deputy President to review how the School has progress the recommendations.

APPENDIX 3

Site Visit Timetable - UCD School of Chemistry

SESSION 1
Review Group Briefing Meeting

Tuesday, 22 February 2022	
All times are local Irish time	
14.30-15.00	Introductions; UCD Quality Office Lead briefing to Review Group members on the quality process; Run through technical platform, collaborative spaces, and any practicalities.
15.00-15.10	Break
15.10-16.00	Review Group Chair to lead discussion on preparation of Preliminary Comments on the Self-Assessment Report (SAR), preparations for the site visit, timetable, initial observations, information requests.

SESSION 2
Review Group Planning Meeting

Tuesday, 1 March 2022	
All times are local Irish time	
14.00-14.45	Preliminary Comments and areas for discussion – Review Group
14.45-15.00	Break
15.00-16.00	Timetable Review, assignment of Review Group roles for meetings/questions, additional information requests

SESSION 3
Review Group Meeting with Registrar & Deputy President, College Principal and Head of School
Organisation/Management of Resources/Strategy

Friday, 4 March 2022	
All times are local Irish time	
16:00-16:30	Review Group only – preparation for Meeting with the College Principal
16:30-17:15	Meeting with College Principal & Dean of Science, UCD College of Science
17:15-17:30	Review Group only – Key observations & preparation for next session
17:30-18:15	Meeting with Head of School
18:15-18:30	Review Group only – Key observations & preparation for next session

SESSION 4
Core Activities & Stakeholder Feedback

Monday, 7 March 2022	
All times are local Irish time	
17:00-17:45	SESSION 4.1, Stakeholder meeting – SAR Co-ordinating Committee
17:45-18:00	Review Group only – Key observations & preparation for next session
Tuesday, 8 March 2022	
13:00-13:45	SESSION 4.2, Stakeholder meeting – Academic Staff (at all levels – Professor, Associate Professor, Lecturer, etc.)
13:45-14:00	Review Group – Key observations & preparation for next session
14:00-14:45	SESSION 4.3, Stakeholder meeting – Administrative and Technical Staff
14:45-15:00	Review Group break – Key observations & preparation for next session
15:00-15:45	SESSION 4.4, Stakeholder meeting – Programme Deans & College Leadership
15:45-16:00	Review Group – Key observations & preparation for next session
16:00-16:45	SESSION 4.5, Stakeholder meeting – College Finance Manager, HR Partner, HR Resourcing Consultant
16:45-17:00	Review Group break – Key observations & preparation for next session
Thursday, 10 March 2022	
13:00-13:45	SESSION 4.6, Stakeholder meeting – New Academic Staff
13:45-14:00	Review Group – Key observations & preparation for next session
14:00-14:45	SESSION 4.7, Stakeholder meeting – Undergraduate and Taught Postgraduate students
14:45-15:00	Review Group only – Key observations & preparation for next session
15:00-15:45	SESSION 4.8, Stakeholder meeting – Research students
15:45-16:00	Review Group – Key observations & preparation for next session
16:00-16:45	SESSION 4.9, Stakeholder meeting – Post-Doctoral Researchers and Research Support Staff
16:45-17:15	SESSION 4.9a, Stakeholder meeting – UCD Safety, Insurance, Operational Risk and Compliance Office (SIRC))
17:15-17:30	Review Group break – Key observations & preparation for next session
Friday, 11 March 2022	
12:45-13:00	Review Group break – Key observations & preparation for next session
13:00-13:30	SESSION 4.10, Stakeholder meeting – Programme Deans & College Leadership (cont'd)
13:30-14:00	Review Group – Key observations & preparation for next session
14:00-14:45	SESSION 4.11, Stakeholder meeting – School Committee Chairs
14:45-15:00	Review Group – Key observations & preparation for next session
15:00-15:45	SESSION 4.12, Stakeholder meeting – School support service staff
15:45-16:00	Review Group break

16:00-16:30	SESSION 4.13, Stakeholder meeting – Alumni & Employers
16:30-17:00	Review Group break
SESSION 5 **Exit Presentation**	
17:00-17:20	SESSION 5.1, Review Group key findings (commendations & recommendations) College Principal, UCD College of Science; and UCD Director of Quality
17:20-17:40	SESSION 5.2, Review Group key findings (commendations & recommendations) Head of School; and UCD Director of Quality
17:40-18:00	SESSION 5.3, Review Group key findings (commendations & recommendations) All School staff; and UCD Director of Quality
18:00-18:10	Review Group only – Remote Site Visit close out & next steps

SESSION 6
Review Group Drafting Session 1

Friday, 25 March 2022	
All times are local Irish time	
14:00-15:00	Review Group Drafting Session 1

SESSION 7
Review Group Drafting Session 2, w/ sign-off

Friday, 22 April 2022	
All times are local Irish time	
15:00-16:00	Review Group Drafting Session 2, with sign-off on Report