

QUALITY ENHANCEMENT UNIT



REVIEW PANEL REPORT

SCHOOL COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Date: 26th – 28th February 2019

“By embedding a strong quality-enhancement ethos, we will use our quality processes to ensure a culture and experience of best practice in the delivery of our academic mission, demonstrating our commitment to continuous evolution and improvement”

(UCC’s Strategic Plan 2017 – 2022, p.23)

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Panel Report Template

Part 1 - Overall Analysis

1.1 List of Panel Members

Name	Position/Discipline	Institution
Professor Jean Bacon	Professor Emerita of Distributed Systems	University of Cambridge
Professor Danny Crookes	Professor Emeritus of Computer Science	Queen's University Belfast
Professor Ursula Kilkelly [Chair]	Head, College of Business and Law	University College Cork
Mr Jack Hickey [Student Reviewer]	Biological and Chemical Sciences II	University College Cork
Dr Martina Scallan	School of Microbiology	University College Cork
Dr Kay Taaffe [Secretariat Support]	Quality Enhancement Advisor	University College Cork

1.2 Context and Overview

Computer Science at UCC enjoys a proud lineage which can be traced back to George Boole, who laid the mathematical foundations for modern digital technology. Computer Science as a distinct Department in UCC was introduced in the late 1970s. Renamed as the School of Computer Science and Information Technology (CSIT), within the College of Science, Engineering and Food Science, the first Head of School was appointed in September 2018. The School is still in transition in terms of adopting School structures, regulations and operations, and anticipates that this process will be completed by mid-2019.

1.3 Methodology, Site Visit and Timetable

The Panel met over three days and the timetable enabled engagement with staff, students, stakeholders and senior management at School, College and University levels (see Appendix 1 for a copy of the timetable). The composition of the Panel ensured broad coverage with external Panel Members selected for their disciplinary expertise, while internal reviewers provided knowledge of the institutional and organisational structures within the University. All Review Panels at UCC include a Student Representative as a full Panel Member and the student member ably represented peer interests. The Site Visit was well-organised with a very full schedule. The Panel was based mainly in the Western Gateway Building and had the opportunity to take a tour of the impressive CSIT facilities. Secretariat support from the Quality Enhancement Unit (QEU) was provided to the Peer Review Panel throughout, to facilitate the review process and to support the Review Panel in formulating and agreeing the final Panel Report. The Panel wishes to thank the staff and management of the School for their engagement with the review process before and during the Site Visit.

1.4 Overall Analysis of Self-Evaluation Process

1.4.1 Self-Evaluation Report (SER)

A coordinating committee was established within the School to facilitate the self-evaluation process and to author the Self-Evaluation Report (SER). The self-evaluation process was very comprehensive and inclusive, and involved extensive engagement with staff, students and external stakeholders. The high quality of the presentation of the SER was complemented by the Panel and University senior management as an exemplar of good practice for other Units undergoing review.

1.4.2 SWOT Analysis

The SWOT analysis took place off-site over a half day and was externally facilitated. All staff were invited and attendance was high. Amongst the key strengths identified were: the state of the art building; effective leadership and collegiality; strong graduate employment; well-established programmes; and good student experience (which include high levels of industry engagement and work-placement). The SWOT acknowledges over-reliance on traditional methods of teaching, and slow adaptation to IT developments. Challenges included gender imbalance, high dependency on international postgraduate (PG) students, and cumbersome university processes for programme development.

1.4.3 Benchmarking

Benchmarking took place against Schools of Computer Science at UCD and the University of Aberdeen, the former being larger and the latter smaller than the School at UCC. There were similarities in terms of the structure of flagship programmes. The industrial placement in the undergraduate programmes emerged as a particular strength of the School of CSIT at UCC. A key aspect that differentiated UCD to UCC was the significant non-academic support for PG programmes: e.g. dedicated programme managers; less reliance on individually supervised projects; and use of blended learning for high demand modules.

1.4.4 Developments since last review

The School has actively followed up on recommendations from the 2010 review. These developments include the move to a School structure; addressing the quota and retention for the flagship programmes; developing student feedback processes; growing numbers on the MSc programmes; and increasing the student-staff ratio – this has changed from 14:1 to 22:1.

1.5 Good Practice Case Study

The Good Practice Case Study involved the Munster Programme Training, which exemplifies the School's external engagement. The project was set up to promote Information and Communication Technology (ICT) to primary and secondary school pupils and over 1,300 primary and secondary students have graduated from this programme. The School tracks the impact of the programme through student awards and progression to STEM/ICT programmes at third level. The Case Study was commended by the Panel and the QEU will engage with the School to publish it on their website.

Part 2 – Findings of the Panel

2.1 School Overview

The Panel was impressed by the highly effective leadership of the School and the strong sense of collegiality, loyalty and buy-in of staff to the review process. There was a very positive atmosphere, with staff across all domains – academic, research and administration – appearing to work effectively together. The School clearly enjoys considerable esteem within the College of Science, Engineering and Food Science (SEFS) and across the University. There was evidence of innovation and agility in responding to change – for example through its interdisciplinary programmes, which closely align with the “Connected Curriculum” objectives of the University’s Academic Strategy. The School has a significant research output, enjoying strong links to SFI (Science Foundation Ireland) research centres, with the reputational gain that this brings. An impact of this is that the School continues to attract talent as exemplified through recent appointments.

2.1.1 *Mission, vision, aims and objectives*

The School’s mission and strategy were clearly outlined in the SER. The School undertook a revision of its strategic plan, which was approved by the College of SEFS in early 2017. The School recognises the fast-moving pace of technology and industry and views change positively as part of the “life-blood” of the field of Computer Science. In its strategic objectives, the School identifies four key areas:

1. Improving the student experience;
2. Strengthening research programmes in strategically significant areas;
3. Reviewing staffing – including workload, and staff support and development;
4. Providing a world-class study and work environment.

The Panel noted excellent industry engagement through work-placement and the goodwill that external stakeholders had for the School. External stakeholders commended the graduates of the School, particularly in relation to their theoretical/foundational knowledge and problem solving skills. The Panel recommends that the School actively harnesses this expertise and goodwill by establishing a School Advisory Committee/Industry Board comprising external stakeholders and alumni, to advise on industry trends, strategic direction and programme planning.

2.1.2 *Unit details including staff and student profile*

The SER presented some clear statistics at the outset: the School has 570 FTEs, 393 under-graduate and 177 post-graduate students. Since the last periodic review, the staff-student ratio has increased from 1:14 to 1:22. The School comprises 27 academic staff; 4 systems administration staff and 5 administrative staff (2 on job-share). In addition, there are 22 full-time research staff with 8 (5 part-time) staff providing administrative and systems administrative support within the research centres. There have been two recent professorial appointments and there are some planned appointments associated with the new programmes.

It was noted that, because of the highly specialised nature of the School, all systems administrative support for the School is in-house. These staff carry out an invaluable service in keeping the specialist (and sometimes aging) equipment in good operational order for students and staff. Because of the fast-changing nature of the technology, and to plan for succession, this group of staff needs to be developed and expanded.

The effectiveness and efficiency of the administrative staff were acknowledged by the Panel, however, with the expanding research workload (post-graduate research is set to double within the next three years), there will be a need for additional administrative staff to support both funded (SFI and other funding bodies) and non-funded researchers. The Panel recommends that, during this expansion phase, care is taken to preserve the continued mutual accord between the School and the research

centres (RICUs)¹, to work towards continued integration of the RICUs into the general activity of the School and ensure that the School's ethos of collegiality and inclusiveness is maintained and protected.

2.1.3 Unit organisation & planning

The School is currently in a stage of transition from Department to School and is developing its own School rules and structures, which will be in place by mid-2019. Although effectively acting as a School for some time, the Panel advises that the transition be carefully managed from a strategic and philosophical perspective in order to retain the collegiality and buy-in of staff. To achieve this, membership of the Executive Management Team will need to be representative and priority given to ensuring coherence and good communication with the wider School.

2.2 Evaluation of Academic Standards

2.2.1 Student "life-cycle"

It was notable that all of the undergraduate (UG) students that the Panel met with were Irish nationals and that all the postgraduate (PG) students were international. This largely reflects the composition of the student cohorts at UG and PG levels. The high employment rate of graduating students, while a strength of the School, means that few continue to postgraduate level. The School is heavily reliant on the local catchment area for undergraduate recruitment and on international students for postgraduate recruitment. The Panel was of the opinion that, given the national and regional demand for more computer science graduates, the School should respond more ambitiously in its strategic recruitment targets. The Panel also recommends that the School develop an internationalisation strategy to support continued recruitment, including at undergraduate level and put in place appropriate supports for EU and overseas students.

Student retention at undergraduate level is an issue for the School (this is also an issue at national level), and the School is taking steps to address this. One suggestion proposed (arising from the benchmarking with UCD) is "drop-in" clinics for student support. On the other end of the spectrum, supporting high-achieving and talented students is also a challenge and the School is clearly examining ways to achieve this. Attracting female students to the School's programmes has been a challenge, and it is intended that the new interdisciplinary programmes will help address the gender imbalance to some extent.

The School identified challenges with centralised programme recruitment procedures whereby recruitment of international students was considered protracted and burdensome. These delays were noted to impact negatively on timely recruitment – in some cases resulting in high-demand programmes being undersubscribed because of the delay in communicating offers to good quality applicants who, in the meantime, accept offers elsewhere. Consideration should be given to streamlining procedures at University level. The School should also consider revising upwards its admissions requirements for its high-demand programmes, so that the best candidates are admitted.

2.2.2 Programme delivery and curriculum planning

The School currently has 12 distinct programme offerings from Level 7 to Level 9 on the National Framework of Qualifications (NFQ) and these are listed in appendix 2. The Panel was satisfied that programme provision is correctly placed on the NFQ, and that the School operates in compliance with European Standards and Guidelines for Quality Assurance in the European Higher Education Area – Part 1.

¹ Research Institutes, Centres and Units

The School also provides service teaching in up to 29 different programmes. The School identifies the importance of this teaching to its FTE income. However, the Panel did question whether this was the optimum use of the School's expertise and resources – particularly in the light of the more recent cross-College programmes with CACSSS.² The Panel recommends therefore, that the School critically examine the fit between its service teaching and the School's strategic objectives. To that end, the School should undertake a review of its module offerings and delivery to ensure the most efficient use of the resources, including expertise and laboratories.

2.2.3 School communication structures

It has already been mentioned that the School is in transition and moving towards new School rules and structures. The Panel noted the excellent collegiality and communication that evidently exists within the School. In the light of the excellent case studies of teaching and learning presented, the Panel was of the opinion that more could be done to encourage dissemination of this expertise within the School through colleagues sharing their experience of employing innovative approaches to class teaching. Beyond the School, academic colleagues who are experienced with leading and assessing group work, could share their expertise University-wide through CIRTl as Group Work Champions. With the dual purpose of enhancing the integration of the School within the College of SEFS and promoting staff development, the Panel suggests that School staff actively put themselves forward for membership of College and University committees.

At programme level, the experience of students varied in relation to communication; while communication was excellent across some interdisciplinary programmes, students reported that this was not always the case. It is clear that cross-College programmes can present particular challenges in relation to timetabling, delivery and assessment, which need to be addressed. The Panel recommends that the School take steps to ensure effective communication, coordination and coherence of the joint programmes from the student perspective.

2.3 Evaluation of Student Learning Experience

2.3.1 Teaching and learning, including the impact of research on teaching

Excellent approaches to teaching and learning – including research-led teaching – have already been highlighted above. Students reported that the quality of the teaching and the engagement of the academic staff of the School was a highlight for them. The group-work project (presented to the Panel) and industry placement were very highly valued by students. The skills developed through group-work are also highly valued by employers. The Panel recommends that opportunities for group work are extended throughout the degree programmes to develop students' transversal skills and to better meet student interests and motivation.

2.3.2 Assessment

It was noted that almost every module has labs which have marked assignments. The labs are supported by academics and this is a considerable drain on human resources and expertise. The Panel was of the opinion that the School could be more creative in relation to assessment – including potentially having industry and potentially post-doc involvement in supervising projects. In addition, the School should review its approach to assessment and assessment weightings (in particular, give consideration to assigning a higher proportion of marks to continuously assessed elements) and ensure timely feedback to students.

² College of Arts, Celtic Studies and Social Science

2.3.3 Learning resources (staffing, physical, technical, other)

Both staff and students were very appreciative of the excellent facilities and resources that are available to students. Having previously allocated “home” laboratories for particular programmes, the School is moving towards students having access to most labs to make better use of laboratories and facilities. The School might consider if more generic labs might provide better use of space. Students commented on the absence of quiet areas for individuals and small groups to meet. Given the expansive open areas on the ground floor, this is a missed opportunity. It is, for example, noticeable that the seating around the trees requires people to sit with their backs to each other! The Panel suggests that, should the occasion arise for a reconfiguration of the space, shared communal spaces conducive to conversation and discussion be provided in these areas – in line with current industry practice.

Given the rapidly changing nature of technology, equipment is required to be updated frequently. The School updates its labs on a cyclical basis; the School endeavours to have each lab updated at least once every five years, however this is budget dependent and cannot be assumed. In recent years this schedule of upgrading has been maintained, mainly due to additional income from targeted skills programmes and research overheads. The Panel recognises the importance to students of having familiarity with the latest industry-standard technologies to be employment-ready; the Panel, therefore, recommends that the College supports the School in maintaining up-to-date and industry-level software and hardware.

The issue of senior academic staff supporting labs is critical for the School as this is very resource intensive. The School should develop a strategy for addressing the shortage of high quality tutors and demonstrators, including harnessing the enthusiasm of PhDs and postdocs to support labs and explore the possibility of teaching-only contracts.

2.3.4 Student support

The students that the Panel met were impressive and demonstrated a strong loyalty to the School. Students reported that staff were supportive and there appears to be strong informal pastoral support. Some students on interdisciplinary programmes reported very good communication, however, the effectiveness of the communication across joint programmes was not always consistent – particularly in relation to assessment deadlines.

Students reported that staff use a range of online communication platforms across programmes and modules; the Panel recommends that all staff of the School move exclusively to the University’s new VLE, Canvas from September 2019 to facilitate coherent within-programme-communication from the student perspective.

2.3.5 Postgraduate experience

The Panel was impressed by the enthusiasm and energy of the postgraduate students that they met – all of whom were international students. The students reported that the range of modules on the MScCS is good and that academic staff are active in organising events for students. The integration of postgraduate students into wider University life varied, depending on whether they had spent time as undergraduates at UCC or not. It was evident that some of the postgraduate students were engaged in organising a range of CS activities and events within of the School. Other students reported that they would welcome the opportunity to engage in tutoring and learning support within the School, but had not realised that this opportunity was there. With the imminent recruitment of greater numbers of PhD students, the Panel recommends that the Graduate School should be developed to enhance the student experience and ensure full utilisation of wider University support. The School should link with the Dean of Graduate Studies to ensure that the PhD experience is in line with University policy.

2.3.6 External links/community engagement/employability

With the School's improved international ranking (QS 2019), it is ideally placed to proactively develop its international reputation. As part of its internationalisation strategy, the School should capitalise on its research record through the dissemination of this good work through inward and outward mobility of staff, research students and postdocs.

The School is evidently widely engaged with industry through work-placement and demonstrated excellent community engagement through its Munster Programme Training. It has already been mentioned that the School should leverage the goodwill and expertise of industry through the establishment of an Advisory Board. The Panel sees a further opportunity for the School to exploit connections with graduates and to engage with the Development & Alumni Office to increase philanthropic funding, for example, to be used for strategic staffing and labs.

2.4 Staff

2.4.1 Staff Profile

The staff profile has been detailed in section 2.1.2 above. The School has recently enjoyed a number of senior appointments after a period of stagnation in recruitment, however the School will need to plan for leadership succession and for new appointments as the programmes expand. A critical area for the School will be ensuring the continuity of the expert systems administrative staff who provide an invaluable service in maintaining the School's specialised equipment and technology. The Panel suggests that new administration staff appointed to support the expanding research agenda should be integrated within the School to retain the existing strong links between the School and the RICUs.

Senior academic staff supporting labs and marking assignments poses a challenge in terms of resource allocation and utilisation. A suggestion was made by the Panel experts that the School should consider on-line presentations and support for students which would be less resource heavy, once the material had been created.

2.4.2 Staff Development Objectives

Due to the fast-changing nature of this discipline, staff are required to constantly upskill – not only at discipline level, but also to stay abreast of innovative teaching technologies. Opportunities for promotion have opened up across the University, with expertise in teaching and learning, as well as research, being considered for promotion purposes. There should, for example, be opportunities to expand the publications of the School in e-learning. The Panel recommends that the School creates and implements a staff development plan which enables staff to proactively advance their own career objectives, aligned with the strategic direction of the University. These could, for example, include workshops where colleagues share expertise and encourage the adoption of innovations in teaching and learning within and beyond the School and information and support on staff promotion.

The School acknowledges challenges in relation to the recruitment of female staff and there is an obvious gender imbalance in the School. The Panel recommends that the School put in place a gender action plan to work towards an Athena Swan award.

Part 3: Recommendations

3.1 Recommendations to the School

The Panel recommendations have been categorised under a number of headings (underlined).

Strategic:

The Panel recommends that the School:

1. Responds more positively/ambitiously in its strategic targets, taking account of the national and regional demand for more computer science graduates, and strong student demand at graduate level.
2. Harnesses existing external expertise and goodwill by establishing a School Advisory Committee/Industry Board comprising of external stakeholders and alumni to advise on industry trends, strategic direction and programme planning.
3. Undertakes a review of its module offerings and delivery to ensure the most efficient use of resources, including expertise and laboratories; ensure that students have familiarity with the latest industry-standard technologies and opportunities to develop their soft skills.
4. Develops an internationalisation strategy including expanding the recruitment and support of students at undergraduate level and for inward and outward staff mobility.
5. Makes sure that all of the activities are focused on achieving the strategic objectives of the School.

Reputation and rankings:

The Panel recommends that the School:

6. Exploits the School's improved international ranking (QS 2019) and proactively develop its international reputation.
7. Capitalises on the School's strong reputation within the College of SEFS and within the University to ensure that the School is adequately resourced in line with its ambition.
8. Exploits connections with graduates and engages with the Development and Alumni Relations Office to increase philanthropic funding for strategic staffing and laboratories.
9. In the context of its highly successful research centres, works to ensure integration of the School and the centres, while ensuring that the School's ethos of collegiality and inclusiveness is maintained and protected.

Staff:

The Panel recommends that the School:

10. Develops a strategy for addressing the shortage of high quality tutors and demonstrators, including harnessing the enthusiasm of PhDs and postdocs to support labs, and explore the possibility of teaching only contracts.
11. Creates and implements a staff development plan which enables staff to proactively advance their own career objectives, aligned with the strategic direction of the University
12. Puts in place a gender action plan to work towards an Athena Swan award.

Teaching, Learning, Assessment and Student Experience:

The Panel recommends that the School:

13. Takes steps to ensure communication, coordination and coherence of the joint programmes from a student perspective.

14. Extends the opportunities for group-work throughout the degree programmes to develop students' transversal skills – this addresses student interests and motivation, and employers' expectations.
15. Reviews the approach to assessment and its weightings, and ensures timely feedback to students.
16. Ensures that all staff of the School move exclusively to the University's new VLE, Canvas and other standard University systems.
17. Develops its graduate school, particularly in the light of imminent recruitment of greater numbers of PhD students, to enhance the student experience and ensure full utilisation of wider University supports. Link with the Dean of Graduate Studies to ensure that the PhD experience is in line with University policy.

3.2 Recommendations to the College

The Panel recommends that the College:

1. Works with the School to address the lack of tutors and demonstrators.
2. Supports the School in maintaining up to date and industry-level software.
3. Supports the School to develop its internationalisation strategy, capitalising on the reputational gain that arises from their work with the RICUs.

Appendix 1: Timetable

SCHOOL OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY PEER REVIEW PANEL SITE VISIT TIMETABLE

Tuesday 26 February 2019	
12.30– 13.00	Convening of Panel members and lunch.
13.00 – 14.30	Briefing and private meeting of Panel
14.30 – 15.30	Meeting with Head, School of Computer Science and Information Technology (to be joined by the School Manager at 15.10)
15.30 – 16.00	Tea/coffee
16.00 – 17.00	Meeting with School staff
17.10 – 18.00	Meeting with Stakeholders Graduate Student Research Manager, Dell Representative from Kleevar Work Placement Manager (SEFS), UCC Representative from IDA Ireland Representative from Qualcomm Representative from Pilz Ireland Representative from IBM
19.00	Informal dinner for members of the Panel & staff members of the School

Wednesday 27 February 2019	
09.00 – 09.15	Convening of the Panel
09.15 – 10.15	Enhancing Student Learning Experience Topics: Final Year Project Research-led teaching Group Work
10.15 – 10.45	Tea/coffee
10.45 – 11.30	Tour of School facilities
11.30 – 12.15	Meeting with Head of College

12.30 – 13.30	Lunch and private meeting of the Panel
13.30 – 14.00	Undergraduate students, with representatives from: 1st year, BADHIT 1st year, BA P&P – 2 x student representatives 1st year, BScDSA – 2 x student representatives 4th year, BADHIT 4th year, BScCS – 2 x student representatives
14.00 – 14.30	Postgraduate students, with representatives from: PhD – 5 x student representatives MScCS – 2 x student representatives MScDSA
14.30 – 14.45	Break
14.45 – 15.15	Meeting with Deputy President & Registrar
15.15 – 15.45	Tea/coffee
15.45 – 16.30	Meeting with Senior Officers of the University: Vice-President for Learning and Teaching Office of the Vice-President for Research and Innovation
16.30 – 17.30	Meeting with Programme Coordinators/Chairs of Boards of Studies of the following: BSc Computer Science BA Digital Humanities and Information Technology and MSc Interactive Media MSc Data Science and Analytics BSc Psychology and Computing Higher Diploma in Applied Computing Technology BSc Data Science and Analytics MSc Computing Science
19.00	Working private dinner for members of the Panel to commence drafting the report.

Thursday 28 February 2019	
08.45 – 09.00	Convening of the Panel
09.00 – 10.00	Meeting with Head of School

10.00 – 11.00	Tea/coffee and private meeting of Panel
11.00 – 11.30	Closing presentation
11.30 – 15.00	Further work on drafting the final report (lunch)

Appendix 2: List of the School's Programmes

PROGRAMME	NFQ LEVEL
BSc (Ordinary) Computer Studies	Level 7
Diploma in Computer Studies	Level 7
BSc Computer Science	Level 8
BSc Data Science and Analytics	Level 8
BA Psychology and Computing	Level 8
BA Digital Humanities and Information Technology	Level 8
Higher Diploma in Applied Computing Technology	Level 8
MSc Data Science and Analytics	Level 9
MSc Computing Science	Level 9
MSc Interactive Media	Level 9
EXIT AWARDS	NFQ LEVEL
BSc Computer Science (Ordinary)	Level 7
Postgraduate Diploma in Data Science and Analytics	Level 9
Postgraduate Diploma in Computing Science	Level 9
Postgraduate Diploma in Interactive Science	Level 9