An Chomhairle Mhúinteoireachta
The Teaching Council

Final Report of the Review Panel to the Teaching Council following a review of a reconceptualised programme submitted for accreditation by University College Cork

Bachelor of Science Education

14 October 2013

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1. Background

The Teaching Council is the statutory body charged with setting the standards for entry to the teaching profession and ensuring that these standards are upheld.

In accordance with Section 38 of the Teaching Council Act, 2001, the Council shall:

(a) review and accredit the programmes of teacher education and training provided by institutions of higher education and training in the State,

(b) review the standards of education and training appropriate to a person entering a programme of teacher education and training, and

(c) review the standards of knowledge, skill and competence required for the practice of teaching,

and shall advise the Minister and, as it considers appropriate, the institutions concerned.

The Teaching Council's role in relation to the review and accreditation of programmes of Initial Teacher Education (ITE) is distinct from the academic accreditation which programmes also undergo. Academic accreditation is based on the suitability of a programme for the award of a degree/diploma, whereas professional accreditation for any profession is a judgement as to whether a programme prepares one for entry into that profession.

The review and accreditation of programmes of ITE by the Teaching Council provides an opportunity for Higher Education Institutions (HEIs) to demonstrate that they offer quality programmes of teacher education. It is expected that the graduates of such programmes will achieve programme aims and learning outcomes which are aligned with the values, professional dispositions, and the standards of teaching, knowledge, skill and competence that are central to the practice of teaching.

In order to guide its review of programmes, the Teaching Council has published *Initial Teacher Education: Strategy for the Review and Accreditation of Programmes* (hereinafter referred to as the Council's review strategy). That document sets out the process by which programmes are reviewed.

In carrying out reviews, the Council is mindful of its *Policy on the Continuum of Teacher Education* which sets out its vision for teacher education at all stages of the continuum – ITE, Induction, and Continuing Professional Development. Published in 2011, the policy highlights the evolving and dynamic context for teaching and the increasingly complex role of teachers in Ireland today. The policy states (p. 6) that "…the time is now right for a thorough and fresh look at teacher education to ensure that tomorrow's teachers are competent to meet the challenges that they face and are life-long learners, continually adapting over the course of their careers to enable them to support their students' learning." It further states that innovation, integration and improvement should underpin all stages of the continuum.

In parallel with the development by the Council of its Policy on the Continuum of Teacher Education, the Minister for Education and Skills initiated a national consultation process on the theme of improving literacy and numeracy. This culminated in 2011 with the publication of *Literacy and Numeracy for Learning and Life* as the national strategy to improve literacy and numeracy standards among children and young people in the education system.

The strategy emphasised teachers' professional development and proposed that the duration of initial teacher education (ITE) programmes should be extended and that programme content should be reconceptualised.

The Teaching Council, having established an Advisory Group on Initial Teacher Education, developed criteria to be observed and guidelines to be followed by providers in reconceptualising programmes of initial teacher education at primary and post-primary levels. They were approved by the Council and published in June 2011 as *Initial Teacher Education: Criteria and Guidelines for Programme Providers* (hereinafter referred to as the Council's criteria). These relate to a range of areas, including programme design, areas of study, duration of programmes, the numbers and qualifications of staff, facilities and resources. As such, they form the bridge between the Council's policy and the development and implementation of reconceptualised programmes. Significantly, the criteria:

- prescribe those areas of study which will be mandatory in programmes, including numeracy and literacy, behaviour management, parents in education, ICT and inclusive education
- set out for the first time the expected learning outcomes for graduates of all ITE programmes
- propose raising the minimum requirements for persons entering programmes of ITE at primary level and a literacy and numeracy admissions test for mature entrants
- require a 15:1 student-staff ratio
- call for the development of new and innovative school placement models, involving active collaboration between HEIs and schools, and an enhanced role for the teaching profession in the provision of structured support for student teachers
- require that student teachers should spend at least 25% of the programme on school placement, and that such placements should be in a minimum of two schools
- require increased emphasis on research, portfolio work and other strategic priorities.

While recognising the inter-related nature of all aspects of programmes of teacher education, the criteria and guidelines are categorised under Inputs, Processes and Outcomes. All three dimensions have an important bearing on the quality of teacher education. The required Inputs and Outcomes are clearly elaborated in the document, while the Processes are less prescriptive to allow HEIs the freedom to develop the processes which best suit their individual situations.

In November 2011, the Council published *Teaching Council Requirements for Entry onto a Programme of Initial Teacher Education,* which set out the Council's revised subject criteria in draft form. The draft criteria, which represent the Council's latest thinking in this area, were approved by Council in December 2012 and have been forwarded to the Department of Education and Skills, in the context of Council advice on entry requirements to ITE. They have guided providers of post-primary concurrent programmes in determining the subject content coverage which is appropriate.

Providers of existing programmes have been asked to reconceptualise their programmes in line with the revised criteria and to submit them for accreditation. This report relates to the review of the following programme provided by University College Cork: Bachelor of Science Education [BSc (Ed)] - hereinafter referred to as '*the programme'*.

This is a 240 ECTS credit programme offered over four years which prepares students to teach one of the following subjects depending on which specialism they choose, and Junior Cycle Science:

- Physics
- Chemistry
- Biology

The programme received academic accreditation in March 2013.

2. The Review Process

The review of Bachelor of Science Education took place between March and July 2013, in accordance with the Council's review strategy. The process was formally initiated when the Review Panel (hereinafter referred to as 'the panel') was appointed by the Teaching Council's Director, with Professor Sheelagh Drudy as Chairperson.[1] To assist and support the work of the panel, Dr Patrick O'Connor was appointed as Rapporteur. His functions included liaison with University College Cork (hereinafter also referred to as 'UCC'), maintaining records of meetings, and drafting and finalising the panel's report in conjunction with the panel Chairperson. The panel was also supported in its deliberations by external subject experts and by the Director and staff of the Teaching Council.

Documentation relating to the application was submitted to the Teaching Council by UCC in January 2013. The panel met initially on 28 March 2013 to give preliminary consideration to the UCC submission. Following this meeting, individual members of the panel focused on specific aspects of the submission and circulated their comments and questions to other members of the panel. Issues for further clarification were identified by the panel and were communicated by the Rapporteur to UCC. Following consideration of the documentation and a collation of the initial views of the members of the panel, the panel and Rapporteur met and engaged with staff members who made a presentation embracing the several elements of the programmes on 11 April 2013.[2] On 8 April UCC advised the Panel that it was introducing a Biology stream to the programme. A further meeting of the panel was held on 12 April 2013. Subsequently, in the course of reviewing the documentation, the panel maintained contact on a systematic basis both by e-mail and telephone. Moreover, on 21 March 2013 and again on 28 May 2013, the Chairpersons of three review panels and their Rapporteurs attended a meeting convened for the primary purpose of identifying commonalities of judgement and refining reporting conventions and procedures.

[1] Details of the Review Panel membership are included in Appendix 1

[2] A list of the staff member presenters and their topics is included in Appendix 2

3. Publication of this Report

The Teaching Council routinely makes information available to the public in relation to its functions and activities and, in line with that practice, this report will be available on the Council's website, www.teachingcouncil.ie.

4. Documentation

The documentation submitted in January 2013 by UCC was in accordance with the template provided by the Teaching Council in the Pro Forma and Guidelines which accompany the Council's review strategy. Key areas of focus were:

4.1 Inputs

- Conceptual Framework
- The Programme
- Programme Aims
- Programme Design
- Areas of Study
- Teaching, Learning and Assessment Strategies
- School Placement
- The Duration and Nature of the Programme
- Student Intake
- Staffing
- Facilities
- Student Support and Guidance Systems
- Communication and Decision-Making Structures
- Financial Resources

4.2 Processes

- Teaching, Learning and Assessment Approaches
- Engagement of Student Teachers with the Programme
- Engagement of Student Teachers with Staff and with other Student Teachers
- Progression within the Programme
- Personal and Social Development
- Development of Professional Attitudes, Values and Dispositions
- Lifelong Learning
- Reflective Processes

4.3 Outcomes

- Knowledge-Breadth/Knowledge-Kind
- Know-How & Skill-Range/Know-How & Skill-Selectivity
- Competence-Context/Competence-Role
- Competence-Learning to Learn
- Competence-Insight

5. Overall Findings

Having regard to the documentation that was initially submitted, together with the complementary clarifications that were provided pursuant to the visit to the univeristy and meeting with programme staff, the panel adjudges that this 240 ECTS credit programme satisfies the criteria set down by the Teaching Council in its *Criteria and Guidelines* and in its curricular subject requirements. Accordingly, it recommends to the Teaching Council that the programme be granted accreditation.

The programme offers a specialism in one of the following three subjects – Physics, Chemistry or Biology. Each of these specialist routings meets the Teaching Council overall requirement of at least 60 ECTS credits in the relevant subject (Physics, Chemistry or Biology - see Appendix 3 for further details). The programme also meets the Council's requirements for the inclusion of at least 10 ECTS credits each of Biology and Physics in the case of the Chemistry specialism, at least 10 ECTS credits each of Chemistry and Physics in the case of the Biology specialism and at least 10 ECTS credits each of Chemistry and Biology in the case of the Physics specialism which meet the Council's requirements for the Junior Certificate subject Science in each of the specialist subjects. On that basis, the panel is happy to recommend that graduates may have the subjects Physics, or Chemistry or Biology together with Science (Junior Cycle) recorded on the Register of Teachers, as appropriate to the relevant specialism taken.

The commendations in Section 6 below relate to areas of particular strength which the panel has identified.

With regard to the recommendations in Section 7, the panel suggests that the Teaching Council should require the college to set out and submit, within twelve months of receiving the final review report, its proposals for implementing the recommendations. It further recommends that the Teaching Council should prioritise those areas to be accorded particular attention when the programme falls due for review again.

The stipulation in section 8 relates to an area which the panel believes to be of such strategic importance to the programme that accreditation should be subject to it being met. Therefore, the panel recommends that the Teaching Council should require the university to set out and submit to the Teaching Council, within two months of receiving the final review report, its proposals for implementing the stipulation.

In the case of the national issues raised in Section 8 of this report, the panel recommends that the Council engage in dialogue on those issues at national level.

The panel proposes that accreditation of the programmes would have a lifespan of five years.

6. Commendations

Having regard to:

1. the documentation which was submitted
2. advice received from the subject specialists who supported the review process, and
3. information gleaned during the meeting with UCC and from communications with programme staff

the panel has noted a number of particular strengths of the programme, as follows:

6.1 Engagement with the review process

The panel is impressed by the high level of commitment of staff members. A passion for their areas of expertise was clearly evident in the course of our visit, and notably so in respect of the highly motivated Programme Coordinator who exudes an exemplary enthusiasm for science and the teaching of the sciences. This gives ample assurance of an ethos of high quality learning that underpins an innovative and enlightened programme of teacher preparation. This is commendable. In addition, the panel is impressed with the level of cross-disciplinary engagement in the BSc (Ed) which was evident in the participation of senior members of the College of Science, Engineering and Food Science, as well as the School of Education, in the review process.

6.2 Inputs

6.2.1 The submission documents

The submission documents are commendable for an admirable clarity and conciseness that combines with a welcome ease of navigation that allows for an easy identification of the depth and breadth of intended learning experiences. They provide a very useful vista of the various elements of a programme that recognises domain knowledge, understanding and the development of pedagogical repertoire as fundamental to the emergence of effective science teachers. All this is usefully carried into a further alignment of learning outcomes with relevant subject areas, and the overall impression given is of a highly coherent and carefully constructed suite of modules.

6.2.2 Conceptual framework and programme aims

The conceptual framework is notable for an impressive coherence and philosophical underpinning that is robustly grounded in recent research on the sciences and teacher education. An enquiry-oriented approach permeates the whole programme and is key to a purposeful integration of the various aspects of study. Closely aligning with principles promoted by the Teaching Council, the programme aims are prominently set out and elaborated upon in a clear and concise fashion. Essentially, the intention is to produce knowledgeable, reflective and technically proficient practitioners who as members of professional communities of practice are concerned with the purposes of education and its consequences, and who as lifelong learners are enthusiastic about inspiring all their pupils. The panel commends the department for its commitment to these ideals.

6.2.3 Programme design

It is clear that the planners have devoted considerable care and thought to the design of a four-year programme that produces a graduate who has specialised in one science subject and who has a creditable grasp of the knowledge and skills attaching to two other science subjects and to mathematics.

This is achieved by students entering a common first year with other science students during which they study Physics, Chemistry, Biology and Mathematics; they pursue their specialism [3] in the second year in addition to a module on science education and a teaching placement structured around lectures and science practicals; this pattern is repeated in third year but at a more advanced level; and finally, in the fourth year they study Education modules exclusively in addition to school placement. All this is designed to ensure that graduates will have a good foundation in the three science subjects which are part of the Junior Certificate Science curriculum. Further, and importantly, it gives credence to UCC's claim that the student teachers' specialist science area and their laboratory skills will be of the same standard as that of mainstream BSc students. Clearly, this is crucial for those who ultimately may choose to work outside teaching. The panel recognises this as a fundamental strength of the programme and, further, it is impressed that the overall design with a single specialism facilitates a straightforward, efficient and exemplary meeting of the ECTS credit targets for a four-year concurrent post primary programme.

6.2.4 Facilities

The HEI has a well-equipped and extensive campus that presents as an attractive centre of learning. The panel is particularly impressed with the wide range of facilities available to the BSc (Ed) students and wishes to commend the vision and initiative that have led to the provision of two Teaching Resource Centres (housing a wide range of teaching materials, including those for science), a Computer Laboratory with a modern and recently upgraded suite of computers available at all times through the day and night, and most notably the impressive and aptly named *Eureka Centre for Inquiry Based Education in Science and Mathematics*. The centre has been specifically designed as a teacher education facility and consists of two purpose built science education laboratories that are fully equipped to teach all Leaving Certificate science subjects. In addition, it houses the Science Resource Centre that contains a wide variety of teaching resources to aid in the preparation of lesson plans, and there too is a seminar room that is fully equipped for online teaching and learning. It is entirely credible, as asserted by UCC, that the Centre is alive with science activities throughout the week, with students regularly mixing with experienced members of Cork's Irish Science Teacher's Association who base their meetings there. Further, it is worth noting that the Eureka Centre is the only facility in Ireland that has received international recognition from ICASE (International Council of Associations for Science Education) and has been designated as one of only five ICASE Science and Technology Centres in the world.

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3 Students will choose <u>one</u> of the following specialisms for major study: Physics, Chemistry or Biology, with additional modules to meet the Teaching Council criteria for the teaching of junior cycle Science. Each of the specialisms meets with the Council registration requirements.

6.2.5 Teaching, learning and assessment strategies

The panel welcomes the enquiry orientated approach that permeates the whole programme and recognises its key function in integrating the various aspects of study. It welcomes too the central intent to produce reflective and dynamic practitioners, a process that is underpinned by the assessment strategy. This is seen in the mixture of formative, summative and continuous assessment that operates throughout the programme: there are no end of year written examinations in the Education modules, whereas in science the modules are examined by means of a mixture of summative (usually written examinations) and continuous assessment (usually laboratory and project work). Notably, from early in the programme formative assessment, incorporating self and peer evaluation, is prominent in promoting students' capacity to review their strengths and weaknesses. In this regard, the department's systematic promotion of portfolio work is valuable in that it is geared to encourage a productive reflection on progress that is rooted in practical experience. In addition to formal lectures, weekly microteaching sessions in small student-led tutor groups feature from early in the programme and here, under the guidance of the department tutors, students are purposefully led to negotiate realistic targets based on perceived links with subject pedagogy. This usefully extends to a very high level of laboratory practical sessions, and an examination of the timetable gives eloquent testimony to an intensive engagement with the chosen science subject and how it directly relates both to the practical and theoretical dimensions of the post primary curriculum. The panel finds all this commendable.

6.2.6 School placement

Structure of placement

The panel acknowledges that the school placement component of the programme is given due prominence and that the organisational and assessment arrangements display a rich potential to support the emergence of teachers who identify themselves as lifelong learners, collaborative staff members and agents responsive to the whole school community. This is commendable.

Given that the current intake quota is only twenty students per year and the average class size is ten, the department is well positioned to offer support of an individual nature during school placements (and indeed throughout the programme); and, further, the fact that the cohort is small means that the problems associated with placement of students is insignificant. Having opted for a teaching career after completing the common first science programme, students have their first experience of teaching for a period of ten weeks in the first term of second year. This takes place locally and, accordingly, students experience little difficulty in accessing their schools. This arrangement is repeated in third year, but in a different local school. Finally, in fourth year, placement extends across the entire year with mornings in the school and afternoons attending lectures, tutorials, microteaching and laboratory practical sessions in the HEI. (Further, and crucially, it has been confirmed to the panel that within this scenario, in accordance with Teaching Council requirements, a student will experience one period of ten full-day weeks.)

The panel sees a number of strengths attaching to the placement model over the entirety of the programme: it means that both part-time and full-time staff of the School of Education are in regular contact with the students and problems encountered in the mornings can be examined and resolved in the evening; also the students experience the full range of school activities over the entire year e.g. setting term examinations, organising projects for the Young Scientist Exhibition, attendance at parent-teacher meetings etc. This is admirable.

Details of support

A comprehensive *Memorandum of Understanding* has been negotiated between the School of Education and the host schools and this brings a welcome clarity to the relationship between UCC and the school and the roles expected of the different actors. A vital feature of the document centres on best practice which gently but purposefully encourages schools to recognise the student as a professional in training, one whose experience over the weeks should be illuminating, developmental and well-balanced. Again this is laudatory.

In fourth year when school placement takes on a vital significance, students will teach a minimum of six lessons per week i.e. approximately one-hundred hours per year under the supervision of their mentor co-operating teachers. Over the course of the programme the student teacher is supported by at least two placement tutors who are detailed to liaise closely with the co-operating teacher in providing structured support, and there are further crossover visits by tutors from the same cognate group. The panel is greatly assured that the placement tutors are well-qualified, experienced teachers who are employed for their pedagogic expertise which includes a reflective and enquiry-approach to curriculum and practice. And, crucially, they receive ongoing professional development that includes carefully planned sessions designed to promote joint understandings especially in relation to consistency and equity in supporting student performance in school. Again the panel is happy to commend these arrangements.

Laboratory practical work during placement

The panel notes with approval that UCC puts a premium on ensuring that the student teacher is given a high measure of useful support in the preparation of lessons throughout the period in school. This is particularly obvious in respect of preparation of lessons for Junior Science which consists of three subjects (Physics, Chemistry and Biology), two of which is commonly outside of their subject specialism. Within this scenario the student turns to the well qualified science education staff based in the Eureka Centre who play a central support role in advising on the practicalities of lesson planning throughout the placement periods. Essentially, the student is facilitated in carrying out the relevant laboratory work in the Eureka laboratories before carrying out these experiments with pupils. In addition, students are encouraged to borrow equipment such as high technology data-logging devices that may not be readily available in the school. While developing student expertise, this easy relationship with personnel in Eureka has the additional value of promoting student crucial awareness of the Health and Safety considerations that need to be at the core of science teaching. For its practical support of their students in preparing the practical component of their teaching, the

panel commends the department.

6.2.7 Exit route

The panel is pleased that students who ultimately decide that they are not suited to a career in science teaching may transfer out of the programme into mainstream BSc with little difficulty and need have relatively little concern for their capacity to meet the consequential challenge. The panel commends the School and Programme Coordinators for their determination in ensuring that the standard science content is the same for the BSc (Ed) students as for mainstream BSc counterparts.

6.2.8 Pastoral dimensions

The panel commends UCC for initiatives that are pastoral in nature and indicative of a sharpened sense of social responsibility and moral purpose that will inevitably influence students in their careers as teachers. This is seen in the organisation of science workshops within and outside UCC (by department and students) and centring on pupils attending schools recognised as disadvantaged; it is seen also in peer assisted learning arrangements which involve students in helping each other in a structured way. It is seen too in formalised, individualised supports for students whose post-primary grounding in Physics/ Chemistry/ Mathematics has been limited. All this is commendable.

6.2.9 Literacy and numeracy

The panel has due regard for the key national priorities of literacy and numeracy. It notes that the fostering of literacy and numeracy as outlined in the national strategy is given as one of the key aims in the BSc (Ed). In particular, the panel commends the approach to numeracy in this programme. Strong emphasis is placed by the Programme Coordinator on the teaching of mathematics to all students in the common science first year of this programme. The grounds for this are that in an age where science teachers have to integrate literacy and numeracy into the teaching of science, it would be unthinkable that a person could qualify as a teacher of science without some study of mathematics. Thus in UCC all BSc (Ed) students accumulate a minimum of 10 ECTS credits in mathematics in first year.

6.2.10 Academic subjects

Chemistry

The general format of the chemistry programme is very well structured both in content and in the arrangements for student progression. It fulfils the Teaching Council requirements for the teaching of Chemistry to Leaving Certificate (see Appendix 3). What constitutes a particular strength is that a student does not have to choose this final outcome at the time that he/she is completing the CAO application but instead enrols in common first year science programme. A further strength is seen in the previously mentioned exit mechanism that provides for a smooth and straightforward transfer to the general science degree if a student comes to believe that s/he is not suited for a teaching career. In addition, the chemistry staff assigned to teach the content are experienced and research active, and some have published in Science

Education.

The total ECTS credits for Chemistry gives the panel assurance that the students will have a good grounding in Chemistry and the confidence to build on their knowledge subsequently over the years.

The programme maps very well onto the content of what is a long and detailed Leaving Certificate syllabus and, accordingly, will give graduates the confidence and background to deal very satisfactorily with the chemistry elements of the Junior and Leaving Certificate students.

Students who decide to specialise in Chemistry will also have completed a minimum of 25 ECTS credits both in Physics and in Biology (in Years 1 and 2). This is commendable in that it provides a useful and necessary basis for the teaching of Junior Certificate science.

Physics

This is an established programme within the university and has a proven record of success. It fulfils the Teaching Council requirements for the teaching of Physics to Leaving Certificate (see Appendix 3). The students emerge from the course alongside postgraduate students on the PDE programme and perform in their school placement with credit and high levels of competence. It is a strength of the course that it offers students a fresh career path within the initial degree programmes they chose, enabling them to enter school teaching from a secure knowledge base in their subject area. The staff in engineering and mathematics clearly approve of the programme, both in terms of enabling students' alternative career directions and also in making provision for talented teachers to foster future generations of science students towards university study. The modules are carefully chosen and the course fully equips teachers in their chosen specialism while making no attempt to make provision for a second subject. This clearly facilitates the department's admirable pursuit of quality.

The panel notes that aspects of physics studied in Year 1 are built upon in the following years and that the standard reached clearly and easily meets Teaching Council requirements.

The modules of the programme are entirely appropriate to the teaching of Leaving Certificate Physics and, as well, are thoroughly adequate for teaching Junior Certificate Science.

The numerous extra-curricular activities within the Eureka Centre that allow students wide experience of working with both talented and disadvantaged students within the immediate community is a laudatory feature of the physics programme.

Students who decide to specialise in physics will also have completed a minimum of 20 ECTS credits in both in Chemistry and in Biology. This is commendable in that it provides a useful and necessary basis for the teaching of Junior Certificate science.

Biology

The enquiry-oriented approach that forms a central element of the conceptual framework is systematically promoted throughout the biology programme and the panel is impressed that students will be purposefully led to engage in high levels of reflection on biological phenomena that directly relate to the Leaving Certificate syllabus

The programme meets the subject-specific requirements for Biology as set out by the Teaching Council (see Appendix 3).Graduates will have the requisite 60 ECTS credits, with not less than 10 credits studied at third year level of higher (or modular equivalent); they will have acquired sufficient knowledge and understanding to teach the biology syllabus to the highest level in post primary education and the essential areas will have been covered to the required minimum of 40 ECTS credits; experimental/ practical work will feature throughout the programme; and the requirement that a methodology module on the teaching of a science based subject with a minimum of 5 ECTS credits will have been met.

Moreover, students who decide to specialise in biology will also have completed a minimum of 20 ECTS credits in Physics and in Chemistry. This is commendable in that it provides a useful and necessary basis for the teaching of Junior Certificate science.

Having due regard for the challenges presented by the various modules and enrichment that must inevitably follow from a mastery of the various concepts inherent in each, the panel is confident that the programme will be highly enriching for students and will provide a solid basis for a lifetime engagement with biology both within the classroom and without.

7. Recommendations

Having regard to:

1. the documentation which was submitted
2. advice received from the subject specialists who supported the review process, and
3. information gleaned during the meeting with UCC and from communications with Programme Coordinator,

the panel has noted a number of areas of the programme which it recommends be developed. They are as follows:

7.1 An additional year

While readily acknowledging the advantage of providing just one specialist subject in terms of providing a high quality, comprehensive programme in the sciences that fits comfortably and effectively within 240 ECTS credits, the panel recommends that UCC favourably considers developing the programme by the addition of a further year that would allow its graduates proceed, on an optional basis, to the acquisition of a second specialism and a masters qualification. This would be of considerable advantage in increasing the marketability of its students at a time of keen competition for scarce teaching positions. The panel is, of course, aware that the School of Education currently provides a MEdSc. This is provided on a two-year part-time basis and enables participants, inter alia, to build on one of their minor science subjects to the level where they will meet the Teaching Council criteria to teach up to Leaving Certificate level. However, the panel recommends that the faculty explore the feasibility of adding a one-year full-time programme (with such adjustments as might be required to Year 4 of the existing programme) which would enable participants to proceed more speedily to a professional masters qualification and acquire the additional credits required for the recognition of a second science subject to be taught to Leaving Certificate.

7.2 Sustainability and succession planning

The panel acknowledges the central and inspirational role of the current Programme Coordinator in the initiation and building of the programme, in the successful coming together of the different schools and disciplines across two Colleges, in the great success and high esteem in which the programme is held. However, the panel is also aware that there is a need for ongoing sustainability in order to ensure success into the future. With this in mind the panel recommends the appointment of an assistant coordinator to the programme, and additional administrative assistance, in order to support the planned integration of an additional subject stream and the expansion of student numbers. There will also be a requirement for additional support when the new school placement requirements of the Teaching Council are implemented. In addition, the School of Education will require a replacement for the Programme Coordinator post when/if the current incumbent moves on.

8. Stipulation

Having regard to:

1. the documentation which was submitted
2. advice received from the subject specialists who advised the panel, and
3. information gleaned during the visit to the college,

the panel has noted the issue set out in 8.1 below which it considers must be resolved as a matter of priority.

8.1 Staff/ student ratio

The panel is pleased to note that the programme has a proposed annual student intake of just twenty and that there are proposals to recruit two academic staff in the near future. Notwithstanding that, the panel is concerned that the staff-student ratio for the programme is not clear, based on the evidence which has been presented, and would appear to be some way off the Teaching Council target of 1 to 15. This will need to be addressed through the submission of more detailed information and specific proposals for improving the ratio.

9. National Issues

Having regard to:

1. the documentation which was submitted
2. advice received from the subject specialists who advised the panel, and
3. information gleaned during the meeting with UCC and from communications with the programme coordinator

the panel has noted the following issues which it believes merit further attention by the Teaching Council and/or other national stakeholders.

9.1 Length of programmes

The panel is impressed with the way in which the BSc (Ed) in UCC meets all of the criteria for post primary concurrent four-year programmes very comfortably with 240 ECTS credits and a Level 8 designation. In the opinion of the panel this success is related not only to the quality and standards achieved by the programme team but also to the fact that just one major science subject specialism is taken by students along with the expanded education components. (Nevertheless, the panel is recommending that the programme team explore the feasibility of an additional year to bring the programme to professional masters level and to allow for a second science subject to teach to Leaving Certificate level).

Accordingly, the Panel recommends that the accreditation criteria for concurrent post-primary programmes be reviewed. Formerly, four-year concurrent programmes at post-primary were assumed to have an equivalence with an undergraduate degree followed by a postgraduate diploma in education (i.e. 180/240 ECTS credits, followed by 60 credits). From September 2014 onwards, the consecutive route will consist of 180/240 ECTS credits (undergraduate degree) and 120 ECTS credits (postgraduate teaching qualification, henceforth normally at masters level). However, concurrent post-primary programmes will normally consist of 240 ECTS, of which 120 will comprise of education components and 120 of subject discipline components (in the case of degrees in which there are two subject disciplines each subject must amount to the minimum Teaching Council requirement of 60 credits, or 90 credits in respect of certain subjects).

While the panel warmly endorses the increase in education components in both concurrent and consecutive programmes, it is concerned that equivalence can no longer be automatically assumed with regard to the coverage of subject disciplines. This is particularly relevant in respect of concurrent post-primary ITE programmes that combine preparation for two disciplinary degree subjects with the mandatory 120 education credits: here the current allocation of 120 credits to the disciplinary areas can be quite restrictive. This problem is even more acute where a minimum of 90 credits for one of the subject specialisms is required by the Council. These issues create difficulties for HEIs when they endeavour to meet the Teaching Council criteria, align with Leaving and Junior Certificate curricula and map to the Bologna Framework with regard to recommended ECTS credits.

These are major issues which must be addressed by the Teaching Council and the HEIs. These have already been raised by the Council in a letter to the HEIs of 15 June 2012 under the heading of *Balance of Programme Components*. The issue of anomalies is also raised therein, and as an overall comment the Council notes that some HEIs are planning to develop innovative five year programmes.

9.2 Market demand for graduates

Given current economic circumstances and the allied reduction of teaching positions, the panel advises that a study be undertaken to determine with some provision the market demand for graduates of a spectrum of programmes.

9.3 Curriculum Design and Assessment

In the context of the proposed changes to the Junior Certificate programme, and of international best practice, all teacher education programmes should be required to make visible their approach to curriculum design and assessment. In practical terms, this requires a greater emphasis on the processes by which curriculum is designed, the theory and practice of formative and summative assessment and on the uses and limitations of testing. Arising from this, the Teaching Council's criteria and associated Pro Forma and Guidelines should be kept under review, having regard to the evolving context for the junior cycle.

Appendix 1 – Review Panel Membership

Chair – Professor Sheelagh Drudy

Professor Drudy is Professor Emeritus of Education at University College Dublin. She is a former teacher, educational researcher and teacher educator. She was a member of the first Teaching Council appointed by the Minister in 2005. She is currently an external examiner at a number of Higher Education Institutions and has been involved in quality assurance reviews in various HEIs. She chaired the panels which reviewed the Higher Diploma in Art for Art and Design Teachers provided by Limerick Institute of Technology in 2011, and the four degree programmes provided by St. Patrick's College, Thurles in 2012.

Teacher Educator – Professor Mike Watts

Professor Watts is Professor of Education at Brunel University, London. He is a Fellow of the Institute of Physics, a chartered Physicist, and also a Fellow of the UK's Higher Education Academy. Professor Watts was awarded Doctor of Philosophy from the University of Surrey as well as a Certificate of Education (in Physics and Mathematics) from Doncaster College of Higher Education. Professor Watts has been an honorary visiting Professor at several universities, is currently an external examiner for a number of universities in Ireland and elsewhere, and has been involved in quality assurance reviews in various HEIs.

Teaching Council Member – Lily Cronin

Lily Cronin was re-elected to the Teaching Council in the Connacht/Munster/Ulster, Voluntary (post-primary) constituency. She is a practicing Science and Biology Teacher at Mercy Mount Hawk in Tralee and is in her third term as a Teaching Council Member. Lily has 35 years' experience of classroom methodology and management. She also has considerable experience of the Council's Review and Accreditation process, having already served on three review panels for the Council, namely, the panels which reviewed the Bachelor of Science (Education) in Physics and Chemistry in UL in 2010, Postgraduate Diploma in Education in NUI Maynooth in 2011 and the H.Dip in Art for Art and Design Teachers in LIT in 2011.

DES Inspector – Seánie McGrath

Seánie McGrath is a graduate of Thomond College, Limerick and also holds a Masters degree in Exercise Science from the University of Limerick. Prior to being appointed as a Physical Education Inspector with the Department of Education and Skills, he spent nineteen years teaching in a variety of settings including working with people with learning disabilities, DEIS post-primary and as an Assistant Principal with Co. Cork VEC. He has extensive experience in high performance sport, community health, and sport for persons with disabilities.

Rapporteur – Dr Patrick O'Connor

Dr Patrick O'Connor was an inspector with the DES for over thirty years. During this time he worked on the development of whole school evaluation, and when attached to the policy unit was centrally involved in the monitoring of teacher education. For over ten years he was editor of the DES academic journal *Oideas*. A former primary school principal and associate lecturer on the OU MA (Ed), he is a graduate of St Patrick's College, Drumcondra, and UCD, he holds masters degrees in Education from UCC and OU, and his OU doctorate centred on school inspection.

Appendix 2 – Programme staff who attended the meeting on 11 April 2013

The following programme staff made presentations on the topics specified and/or engaged in discussion with the review panel in the Eureka Seminar Room, Kane Building, UCC, on the occasion of panel visit on 11 April 2013.

Prof Kathy Hall, School of Education
- Conceptual Framework

Dr Declan Kennedy, School of Education
- Overview of Programme

Dr Fiachra Long, School of Education
- Foundation Studies

Dr Brian Murphy, School of Education
- Literacy and numeracy

Dr Declan Kennedy, Dr Brian Murphy
- School Placements

Dan O'Sullivan and Denis Burns, School of Education
- Inclusion and Pupils with Special Needs

Dr Paul Callanan, Department of Physics
- Physics Component of BSc(Ed)

Dr Orla Ní Dhubhghaill, Department of Chemistry
- Chemistry Component of BSc(Ed)

Professor John O'Halloran, School of Biological, Earth and Environmental Sciences,
John Lucey, School of Education
- Biology Component of BSc(Ed)

Appendix 3 – Teaching Council Registration Regulations, 2013, Regulation Four: Post-primary Subject Criteria [Draft]

Chemistry

In order to meet the registration requirements set down in the Teaching Council [Registration] Regulations 20XX in respect of the curricular subject of Chemistry, an applicant must meet **all** of the following criteria.

1.

(a) Applicants must hold a degree level qualification, with Chemistry studied up to and including third year level or higher (or modular equivalent).

(b) The qualifying degree must be equivalent to at least Level 8 on the National Framework of Qualifications (NFQ) and with a minimum pass[4] result in all examinations pertinent to the subject of Chemistry.

(c) The qualifying degree must carry at least 180 ECTS (European Credit Transfer System) credits (or equivalent) with the specific study of Chemistry modules comprising at least 60 ECTS credits (or equivalent) and with not less than 10 ECTS credits (or equivalent) studied at third year level or higher (or modular equivalent).

2. The study of Chemistry during the degree must show that the holder has acquired sufficient knowledge, skills and understanding to teach the Chemistry syllabus[5] to the highest level in post-primary education (see www.curriculumonline.ie). To meet this requirement the degree must include the study of all of the following essential areas to a minimum of 40 ECTS credits (or equivalent):

Essential Areas of Study

(a) Organic Chemistry[6]
(b) Inorganic Chemistry[7]
(c) Physical Chemistry[8]
(d) Analytical Chemistry[9]

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[4] Which includes pass by compensation

[5] as approved by the Minister for Education & Skills, and published by the National Council for Curriculum and Assessment (NCCA)

[6] This may include modules in the areas of Structure and Reactivity of Organic Compounds, Functional Group Interconversions, Stereochemistry, Organic Reaction Mechanisms, Aromatic Chemistry, Organic Polymers, Organic Synthesis

[7] This may include modules in the areas of Main Group Chemistry, Transition Metal Chemistry, Organometallic Chemistry, Structure and Bonding

[8] This may include modules in the areas of Energetics and Kinetics, Thermodynamics, Chemical Equilibria, Quantum Mechanics, Electrochemistry

[9] This section may be studied as "stand alone" modules in Analytical Chemistry or may be integrated into modules of Inorganic Chemistry, Organic Chemistry or Physical Chemistry. The study of Analytical Chemistry may include Instrumentation in Chemical Analysis and Spectrometry (atomic absorption, ultraviolet,

The remaining 20 ECTS credits (or equivalent) may be in any of the essential areas above or may be drawn from the following optional areas:

Optional Ares of Study

(e) Environmental Chemistry[10]
(f) Materials Chemistry[11]
(g) Pharmaceutical Chemistry/Biopharmaceutical Chemistry[12]
(h) Industrial Chemistry[13]

3. Laboratory practical work in chemistry must have been completed throughout the degree programme.

4. Applicants must also have completed a programme of post-primary initial teacher education (age range 12-18 year range) carrying a minimum of 120 ECTS credits (or equivalent)[14]. The programme should include a methodology module(s) on the teaching of a Science based subject with a minimum of 5 ECTS credits (or equivalent)[15].

Science (Junior Certificate)

An applicant who meets the registration criteria for **Chemistry** will also meet the requirements for the Junior Cycle curricular subject **Science** if he/she has studied a minimum of 10 ECTS credits (or equivalent) in Biology and a minimum of 10 ECTS credits (or equivalent) in Physics.

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infrared, NMR, mass spectrometry) GC, HPLC, electrochemical methods, solvent extraction

[10] This may include modules in the areas of Water Chemistry, Atmospheric Chemistry, and Pollutants in the Environment.

[11] This may include modules in the areas of Solid State Chemistry, Crystallography, Band Structure.

[12] This may include modules in the areas of Drug Design, Structure-Activity Relationships, Synthetic Methods.

[13] This may include modules in the areas of Batch Process, Continuous Process, Industrial Safety, Industrial Case Studies.

[14] Applicants who have commenced a programme of initial teacher education prior to 1/01/2014 carrying less than 120 ECTS credits may be exempted from this requirement at the Council's discretion

[15] Applicants who have completed a specialist concurrent degree in Chemistry must meet all of the requirements as detailed above. This course should be equivalent to a minimum of 240 ECTS credits

Physics

In order to meet the registration requirements set down in the Teaching Council [Registration] Regulations 20XX in respect of the curricular subject of Physics, an applicant must meet **all** of the following criteria.

1.

(a) Applicants must hold a degree level qualification, with Physics studied up to and including third year level or higher (or modular equivalent).

(b) The qualifying degree must be equivalent to at least Level 8 on the National Framework of Qualifications (NFQ) and with a minimum pass[16] result in all examinations pertinent to the subject of Physics.

(c) The qualifying degree must carry at least 180 ECTS (European Credit Transfer System) credits (or equivalent) with the specific study of Physics comprising at least 60 ECTS credits (or equivalent) and with not less than 10 ECTS credits (or equivalent) studied at third year level or higher (or modular equivalent).

2. The study of Physics during the degree must show that the holder has acquired sufficient knowledge, skills and understanding to teach the Physics syllabus[17] to the highest level in post-primary education (see www.curriculumonline.ie). To meet this requirement the degree must include the study of at least 8 of the following areas:

   (a) Classical Mechanics
   (b) Quantum Mechanics
   (c) Properties of Matter
   (d) Oscillations, Waves, Acoustics
   (e) Thermodynamics
   (f) Light
   (g) Electromagnetism, Electromagnetic Waves
   (h) Electronics
   (i) Condensed Matter
   (j) Relativity
   (k) Atomic, Nuclear and Particle Physics
   (l) Topic in advanced or applied Physics

[16] Which includes pass by compensation

[17] as approved by the Minister for Education & Skills, and published by the National Council for Curriculum and Assessment (NCCA)

3. Experimental/practical work must be completed throughout the degree course.

4. Applicants must also have completed a programme of post-primary initial teacher education (age range 12-18 years) carrying a minimum of 120 ECTS credits (or equivalent)[18]. The programme should include a module(s) on the teaching of a Science based subject carrying a minimum of 5 ECTS credits (or equivalent)[19].

Science (Junior Certificate)

An applicant who meets the registration criteria for **Physics** will also be deemed to have acquired the competency to teach the Junior Cycle curricular subject **Science** if he/she has studied a minimum of 10 ECTS credits (or equivalent) in Chemistry and a minimum of 10 ECTS credits (or equivalent) in Biology.

[18] Applicants who have commenced a programme of initial teacher education prior to 1/01/2014 carrying less than 120 ECTS credits may be exempted from this requirement at the Council's discretion

[19] Applicants who have completed a specialist concurrent degree in Physics must meet all of the requirements as detailed above. This course should be equivalent to a minimum of 240 ECTS credits

Physics and Chemistry

In order to meet the registration requirements set down in the Teaching Council [Registration] Regulations 20XX in respect of the curricular subject of Physics and Chemistry, an applicant must meet **all** of the following criteria.
Applicants should note that meeting the registration requirements for the curricular subject of Physics and Chemistry (combined syllabus) does not automatically imply that registration requirements for the individual subjects of Physics or Chemistry have been met.

1.

a) Applicants must hold a degree level qualification, with Physics and Chemistry studied in the degree with the study of at least one of the subjects up to and including third year level or higher.

b) The qualifying degree must be equivalent to at least Level 8 on the National Framework of Qualifications (NFQ) and with a minimum pass[20] result in all examinations pertinent to the subjects of Physics and Chemistry.

c) The qualifying degree must carry at least 180 ECTS (European Credit Transfer System) credits (or equivalent) with the specific study of Physics and Chemistry comprising at least 60 ECTS credits (or equivalent) with at least 15 ECTS (or equivalent) in Physics and 15 ECTS (or equivalent) in Chemistry and with not less than 10 ECTS credits (or equivalent) studied at third year level or higher (or modular equivalent).

2. The study of Physics and Chemistry during the degree must show that the holder has acquired sufficient knowledge, skills and understanding to teach the Physics and Chemistry syllabus[21] to the highest level in post-primary education (see www.curriculumonline.ie). To meet this requirement the degree must include the study of at least four of the following Physics areas (a) to (g) and at least two of the Chemistry areas (h),(I),(j):

   (a) Classical Mechanics
   (b) Quantum Mechanics
   (c) Oscillations, Waves, Acoustics
   (d) Thermodynamics
   (e) Light
   (f) Electromagnetism, Electromagnetic Waves
   (g) Atomic, Nuclear and Particle Physics

[20] Which includes pass by compensation

[21] as approved by the Minister for Education & Skills, and published by the National Council for Curriculum and Assessment (NCCA)

The degree must also include the study of at least two of the following Chemistry areas:

(h) Organic Chemistry
(i) Inorganic Chemistry
(i) Physical Chemistry

3. Experimental/practical work must be completed throughout the degree course.

4. Applicants must also have completed a programme of post-primary initial teacher education (age range 12-18 years) carrying a minimum of 120 ECTS credits (or equivalent)[22]. The programme should include a module(s) on the teaching of a Science based subject carrying a minimum of 5 ECTS credits (or equivalent)[23].

Science (Junior Certificate)

An applicant who meets the registration criteria for **Physics and Chemistry** will also meet the requirements for the Junior Cycle curricular subject **Science** if he/she studied a minimum of 10 ECTS credits (or equivalent) in Biology.

[22] Applicants who have commenced a programme of initial teacher education prior to 1/01/2014 carrying less than 120 ECTS credits may be exempted from this requirement at the Council's discretion

[23] Applicants who have completed a specialist concurrent degree in Physics must meet all of the requirements as detailed above. This course should be equivalent to a minimum of 240 ECTS credits

Biology

In order to meet the registration requirements set down in the Teaching Council [Registration] Regulations 20XX in respect of the curricular subject of Biology, an applicant must meet **all** of the following criteria.

1. (a) Applicants must hold a degree level qualification, with Biology/Biological Sciences studied up to and including third year level or higher (or modular equivalent).

(b) The qualifying degree must be equivalent to at least Level 8 on the National Framework of Qualifications (NFQ) and with a minimum pass[24] result in all examinations pertinent to the subject of Biology.

(c) The qualifying degree must carry at least 180 ECTS (European Credit Transfer System) credits (or equivalent) with the specific study of Biology/Biological Sciences comprising at least 60 ECTS credits (or equivalent) and with not less than 10 ECTS credits (or equivalent) studied at third year level or higher (or modular equivalent).

2. The study of Biology/Biological Sciences during the degree must show that the holder has acquired sufficient knowledge, skills and understanding to teach the Biology syllabus[25] to the highest level in post-primary education (see www.curriculumonline.ie). To meet this requirement the degree must include the study of at least four of the following essential areas to a minimum total of 40 ECTS credits (or equivalent) with at least one area from a, b or c:

Essential Areas of Study

(a) Botany
(b) Plant Physiology
(c) Ecology
(d) Microbiology
(e) Zoology
(f) Mammalian Anatomy
(g) Mammalian Physiology
(h) Biochemistry
(i) Genetics
(j) Molecular Biology

[24] Which includes pass by compensation

[25] as approved by the Minister for Education & Skills, and published by the National Council for Curriculum and Assessment (NCCA)

The remaining 20 ECTS credits (or equivalent) may be in any of the above essential areas, or be drawn from the following optional areas:

Optional Areas of Study

(k) Biotechnology
(l) Bioinformatics
(m) Pharmacology
(n) Biosciences
(o) Environmental Biology

3. Experimental/practical work must be completed throughout the degree course.

4. Applicants must also have completed a programme of post-primary initial teacher education (age range 12-18 year range) carrying a minimum of 120 ECTS credits (or equivalent)[26]. The programme should include a methodology module(s) on the teaching of a Science based subject with a minimum of 5 ECTS credits (or equivalent)[27].

Science (Junior Certificate)

An applicant who meets the registration criteria for **Biology** will also be deemed to have acquired the competency to teach the Junior Cycle curricular subject **Science** if he/she has studied a minimum of 10 ECTS credits (or equivalent) in Chemistry and a minimum of 10 ECTS credits (or equivalent) in Physics.

[26] Applicants who have commenced a programme of initial teacher education prior to 1/01/2014 carrying less than 120 ECTS credits may be exempted from this requirement at the Council's discretion

[27] Applicants who have completed a specialist concurrent degree in Biology must meet all of the requirements as detailed above. This course should be equivalent to a minimum of 240 ECTS credits.