

From a multidisciplinary to an interdisciplinary curriculum: a case study of curriculum innovation

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ABSTRACT: The HE curriculum tends to be highly discipline-based, designed to deliver a set of subject-based outcomes. Research, on the other hand, is becoming increasingly interdisciplinary in nature, but learning and teaching often fails to keep pace. The University of Southampton's Education Strategy sets out an aspiration to transform education by providing a more flexible, personalised experience for students. This was embodied in a Curriculum Innovation Programme designed to expand choice for students whilst maintaining disciplinary rigour. This paper reports on this experience, exploring the steps taken to create space within a three-year undergraduate curriculum to allow greater freedom of choice for students. The initiative also entailed the development and promotion of a range of new interdisciplinary modules, and the paper outlines the process of change required for these to become embedded in the curriculum. Phase 2 of the programme is moving towards the introduction of a new layer of flexibility.

1 Introduction

The term 'curriculum innovation' encompasses many and varied aspects of educational practice and has been interpreted in different ways by different authors. What they have in common is a focus on the content and design of programmes of study and recognition of the need to adapt to an ever-changing external environment that shapes the aspirations of students following those programmes.

Curriculum innovation is also about the willingness to embrace change and to recognise the opportunities offered by burgeoning educational technologies and the changing landscape of academic research. Attempts to foster a climate of change will almost inevitably face some resistance within institutions in which there is a mixture of deeply-embedded views and attitudes towards higher education and its objectives.

This paper explores one dimension of curriculum innovation: examining the way in which a research-intensive university set about introducing choice and flexibility into the curriculum in order to transform and enrich the student experience. The discussion is based around a case study of experience with the Curriculum Innovation Programme at the University of Southampton (UoS).

2 Curriculum evolution

Today's curriculum is very often seen to be the result of a gradual process of evolution over time, punctuated by the periodic review process. Changes that are introduced may reflect a reaction to perceived need or opportunity. However, full-scale institution-wide innovation requires a proactive and radical attempt to inject change, and is likely to entail strategic intervention at institutional level to initiate and support a programme of enhancement.

2.1 A disciplinary curriculum

The curriculum in higher education (HE) has traditionally been discipline-based. Students enter HE in order to study a discipline, and the curriculum is primarily designed to deliver what is needed for students to become doctors, engineers, lawyers, historians or chemists. Some students may get the opportunity to study joint, or combined, degrees, which expose them to more than one discipline. However, a joint programme is often seen as a degree of

two halves, and thus multidisciplinary in nature, rather than being fully integrated, or interdisciplinary.

This disciplinary view of the curriculum reflects the notion of *curriculum as product* (Fraser and Bosanquet, 2006), which sees the design of a curriculum being dominated by the need to deliver a compendium of disciplinary knowledge and approaches. This focus on the delivery of content may lead to a perceived need to 'cover' a specified set of outcomes within the curriculum. This can then become a straitjacket that inhibits innovation. It may also lead to a preoccupation with modes of delivery and assessment, rather than on education in its broader sense. In turn, this may lead to a compartmentalisation of learning and to emphasising the need to "get through" the necessary subject matter. Students become trapped in subject silos, and may become preoccupied with outcomes, rather than being exposed to new and different ways of thinking.

This approach to the curriculum is reinforced for programmes with strong accreditation requirements from professional bodies, where again the focus is likely to be primarily on curriculum content. Accreditation requirements set constraints on curriculum content, and may make it more difficult to introduce innovations in content.

2.2 Curriculum drift

Within this approach to curriculum, there can be gradual slippage over time – a process that could be described as *curriculum drift*. As the lexicon of knowledge within a discipline expands, so there is pressure to add to curriculum content. In addition, when new staff are recruited there is a tendency to add new modules into the curriculum to reflect the research interest of new academic staff, and to reinforce research-informed teaching.

Coming from a different angle, there has been much discussion about the content of A-level specifications (e.g. in Mathematics), alleging that content has been diluted over the years. This also puts pressure on curriculum content if it is perceived that the HE curriculum has to remedy the deficiencies of pre-University education. Whether this is or is not the case in reality, the perception that it could be puts pressure on curriculum content for HE.

This combination of factors results in increasing specialisation of the curriculum as it evolves through time, and less opportunity for students to exercise choice within the curriculum structure.

For students who wish to follow an academic life-path, this disciplinary focus may meet their aspirations. Indeed, in many cases the curriculum seems designed to produce graduates from undergraduate programmes who are ready for postgraduate programmes that will take them on to doctoral studies. However, this is not necessarily the curriculum that is most suitable for all undergraduates. Not all students of history become professional historians, nor do all chemistry graduates follow a career path that rests heavily on their specific disciplinary knowledge. The curriculum also needs to prepare students for life after HE. This is a contentious area, and it is of course important to maintain a balance between curriculum content and horizon-broadening initiatives. This will require decisions to be made about where to draw the line between the curriculum and the co-curriculum.

2.3 Interdisciplinarity

In contrast to the increasing disciplinary specialisation of the curriculum, academic research is becoming increasingly interdisciplinary. Furthermore, graduates in the workplace outside HE will almost invariably find themselves working alongside graduates from other disciplinary backgrounds. The typical undergraduate single-honours programme does not foster interdisciplinarity, and even joint/combined honours programme often only facilitate multidisciplinary learning, with only limited interaction between alternative approaches.

There is thus an argument for introducing elements of interdisciplinarity into programmes, exposing students to different analytic approaches to global issues in order to prepare them better for life after university.

A key challenge is to find a way to open up opportunities for students to exercise choice within the curriculum and have the flexibility to engage in a learning environment that exposes them to the richness of interdisciplinary studies whilst maintaining the rigour that comes from in-depth study of a discipline.

3 Background to a case study of the University of Southampton

As part of the University of Southampton (UoS) Education Strategy, a Curriculum Innovation Programme (CIP) was launched in 2009 by the then-PVC Debra Humphris (Humphris, 2010). The objective was to extend student choice and flexibility in the curriculum by offering opportunities to engage with interdisciplinary approaches to learning and teaching.

3.1 The institution

UoS is a research-intensive university and a member of the Russell group, with 24,000 students, of which about 70% are undergraduates. The institution was restructured in 2011-12 into eight Faculties¹, covering a broad spectrum of disciplines. This diversity of discipline areas is at once a strength and a challenge for institution-wide curriculum innovation. Teaching takes place in four campuses in Southampton and one in nearby Winchester. The physical separation of the Faculties poses an additional challenge for bringing students together for learning.

The diversity of the institution is a strength because it offers the opportunity to bring together students from such a wide variety of backgrounds and disciplinary approaches. The scope for students to learn from each other whilst expanding their horizons is potentially huge. However, this also raises some significant practical problems. In particular, module leaders need to be constantly aware of the diversity of their students, in terms of experience and familiarity with different forms of assessment. An engineering student may have less experience of writing essays than a history student, but would be more familiar with statistical or mathematical approaches. Furthermore, the challenge of building a workable timetable becomes exponentially more problematic the more programmes are represented on a module.

3.2 The drivers for curriculum innovation

During the late 2000s, UoS was developing a conscious strategy of fostering interdisciplinary research, bringing together researchers from across the faculties to pool their expertise in tackling issues of global significance. It was natural to want to communicate some of the excitement generated by this process to students, who were often perceived to be trapped within the confines of their own subject areas. This was reinforced by the appointment in 2009 of a new VC keen to see students becoming engaged beyond their disciplinary silos.

This approach was further supported by reported comments from employers about graduates from UK universities, that they were often well trained in the rigours of their disciplines, but less confident when pushed beyond this comfort zone. In addition, there was an awareness of the changing tuition fee environment, and the responsibility to provide graduates with a headstart in their life beyond university.

Students were engaged with the curriculum innovation initiative from an early stage. There was frequent contact and discussion with the Student Union, and student representatives contributed actively to the steering group and to discussions about new modules.

¹ Business & Law, Engineering & the Environment, Health Sciences, Humanities, Medicine, Natural & Environmental Sciences, Physical Sciences & Engineering, Social & Human Sciences.

Discussions with other institutions thinking in similar ways (notably the University of Aberdeen, which was already moving in this direction) encouraged UoS to develop its thinking about how students could become engaged beyond their own subject areas whilst maintaining the benefits of studying a discipline in depth.

4 Constraints and prerequisites

In order to have students engaging in interdisciplinary learning, there are a number of key prerequisites. For a start, there need to be interdisciplinary modules available for students to study, and it was decided to commission a number of such modules from across the institution ('CI modules'). An early key decision was then whether such modules would be part of the curriculum, carrying credits, or whether they should sit alongside the main curriculum. There are models, such as the LSE100 (LSE, 2012), that provide inter- or cross-disciplinary modules that do not carry credit, but at UoS it was decided that the CI modules should be embedded within the curriculum, and should carry equivalent credits to subject-specific modules.

This decision imposes two further crucial prerequisites for curriculum innovation. First that students should receive equal credits regardless of their programme of study, and second, that they should be able to achieve their programme learning outcomes in their discipline in a subset of their modules, thus leaving space for interdisciplinary studies.

4.1 Curriculum architecture

For students to gain equal credits from the CI modules, a consistent credit architecture is needed for all participating programmes. At the time of launch of the programme, this was far from the case – the then-PVC likened the situation to a dry-stone wall, in which modules of various credit ratings were meshed together to create the whole, in a sometimes uneven pattern. At this time, there were modules being taught in the University ranging in size from 2.5 to 30 ECTS. After some debate at Senate, it was agreed that all undergraduate programmes would be restructured on to a consistent architecture in which modules would be of 7.5 ECTS or multiples thereof. This required some Faculties to undergo a substantial reworking of programme structures in order to come into line. The typical undergraduate (full-time) programme is thus composed of eight modules per year. This pattern is currently being phased in year by year in some Faculties that needed to restructure their programmes.

With CI modules carrying credit towards degree results and classifications, it was essential to ensure that there was a quality assurance mechanism in place to ensure standards were appropriate. Another early decision was that each module should be 'owned' by a faculty, which would be responsible for administrative arrangements for the module, and for oversight through relevant external examiners.

4.2 Making space

The next step was to ensure that programmes could accommodate modules within the curriculum whilst still delivering the programme outcomes required to meet subject benchmarks. This was already possible in some programmes, but others required adjustments to be made to content and structure.

An additional complication thrown up by this process was that different programmes had space available for free elective options at different stages. In some disciplines, freedom to select free electives came in the first year of the programme, whereas in others this freedom was not possible until the third year (or even the fourth year in the case of some integrated Masters' programmes).

In order to cope with this, it was decided to take advantage of the QAA guidance (QAA, 2009) that an honours degree requires 45 of 60 ECTS at FHEQ Level 6 (similarly at levels 4 and 5). By setting the CI modules at FHEQ level 5, maximum flexibility could be achieved, by

allowing students to forward and backtrack for the CI modules, whilst continuing to accumulate sufficient credits to meet their programme outcomes.

4.3 Financial considerations

The CI project was successful in harnessing the enthusiasm and inventiveness of individuals willing to devote time and energy to enhancing the learning experience of our students. However, the importance of financial incentives should never be underestimated. For curriculum innovation to be successful, these incentives must be appropriate at two levels. First, there need to be incentives to encourage individuals and faculties to devote resources to developing new interdisciplinary modules. Second, there need to be appropriate financial flows to compensate faculties in the delivery of the modules.

Funding was provided for the development of the CI modules, with bids being made to a central fund made available for this purpose. However, for the programme to be sustainable in the long run, the funding for delivery needed to be secure into the future. The funding mechanism for modules was thus reworked to ensure that there was a flow of funds to faculties responsible for delivering the CI modules.

4.4 Timetabling

A major constraint to be faced was to ensure that the timetable could accommodate the variety of choices open to students. Room space has been an issue for the UoS in recent years, and there was much scepticism from staff across the institution that it would be possible to free up choice for so many students without prejudicing the timetable for core programmes.

Rather than opening up all possible modules to all possible students, attempts were made to identify priority modules for each participating programme. Programme leads were asked to select the modules most likely to be of interest to their students, and a menu was created for each programme. These modules would be prioritised in building the timetable, and students wanting to take modules not on their own menu would be permitted to choose other modules only if their timetable permitted. UoS operates a central timetabling system, and in the event the timetable was able to cope.

5 Creating choice: phase 1 of the programme

Having established the necessary framework to allow students to begin to look beyond their disciplines, steps were taken to put the plans into effect. Expressions of interest for the development of CI modules were issued to all Faculties, and work was undertaken to identify programmes whose structures were already able to accommodate free elective modules.

A steering group was established to oversee the development of CI modules. This involved students, academic staff and representatives of the professional services. The new modules were expected to fulfil a set of criteria reflecting a range of dimensions of innovation. This was to encourage approaches to learning and teaching that embraced good practice. In addition to being innovative in content, CI modules were expected to be innovative in delivery and assessment, to include a global dimension wherever possible, to require no prerequisites and to be accessible to students across a range of disciplines. A small sub-panel (including a student representative) evaluated the bids and provided feedback on the applications.

Drawing on expertise across the institution, a series of workshops were organised for module teams to introduce and spread good practice. A critical friend was assigned to each module, reflecting their particular needs for advice and guidance. In particular, attention was focused on the possibilities of innovation in modes of assessment, with workshop sessions organised to spread good practice and to reduce the dependence on the traditional unseen examination.

Emphasis was also placed on the introduction and use of technology in the delivery of CI modules. Developments in this area were reinforced by the establishment in 2012 of the Centre for Innovation in Technologies and Education, which brings together teams from across the University with expertise in technology-enhanced learning. This ensures that those working on materials for new CI modules have access to advice, guidance and best-practice ways on enhancing the learning experience through the use of technology. A number of CI modules are now being considered for development as MOOCs.

Having identified the programmes that could accommodate CI modules, a communications plan was developed to contact academic and administrative staff and to inform the students about the new initiative. This entailed building a clear website (www.southampton.ac.uk/cip), with module information and videos to introduce each of the modules. A series of meetings with key academic and administrative staff were held to explain the plans. A module fair was held to provide information to students through the medium of posters and the opportunity to meet and talk to module leaders. Much of the success of the initiative to date rests on the effectiveness of this communication.

In the first year of implementation, five new modules were provided. 124 students from 11 programmes enrolled and completed the modules. These included modules involving partnerships that crossed Faculty boundaries. For example, a module in Education for Health and Wellbeing involved a partnership between the Education School and the Faculty of Medicine; Global Health involved an interdisciplinary team and specialist guest speakers (including the Vice Chancellor); Living with Environment Change was another cross-faculty initiative that drew on the expertise of experts from different disciplinary approaches across the university. The Management School and Geography respectively provided modules involving business simulation and design skills using internet mapping software.

A series of focus groups were held to evaluate the modules, together with the normal module evaluations undertaken for all modules. Students were enthusiastic about the content and delivery of the modules. In addition to the modules developed under the auspices of the project, students were encouraged to think of taking a single-semester module in a modern language, and the CI menu of modules also drew students' attention to modules already provided by disciplines that required no prerequisites and were considered suitable for a non-specialist audience.

A second round of module development was initiated, with enthusiasm for the programme increasing. The number of programmes participating in the initiative increased substantially, although there were still some faculties where the restructuring of the curriculum was still in process, or where accreditation requirements remained an obstacle.

For the academic year 2012/13, 21 modules were available, attracting nearly 800 students. In addition, about 350 students took the opportunity of studying a language, and a further 350 took up a module that was outside their own disciplinary area. For 2013/14, a further 9 modules have been developed, and the range of programmes whose students can take part has increased further.

6 Creating flexibility: phase 2 of the programme

As the CI modules have become more deeply embedded, new possibilities for flexibility in the curriculum are beginning to open up. Programme specifications are focusing more closely on the way in which core disciplinary programme outcomes can be delivered efficiently within a subset of the modules that constitute an honours degree programme. In some subject areas, it has proved possible to ensure that the core content needed to satisfy national subject benchmark statements can be delivered in six of eight modules per year. This applies in particular to a range of programmes in the Faculties of Humanities and Social and Human Sciences.

This creates the opportunity to offer a continuum of flexibility of choice to students on these programmes. With the single honours outcomes being delivered in the core of the programme, students face a range of possibilities.

Students who wish to preserve a focus on their home discipline throughout their studies can use the non-core modules to deepen their knowledge and understanding of their subject. This route may be especially appropriate for those who intend to undertake postgraduate work or to become professionals in their discipline.

Students who wish to broaden their horizons can elect to take a combination of home discipline modules, CI modules, modules from other disciplines, or can choose to study a language. This would be especially attractive for students who wish to combine the rigour and depth of a single-honours degree with exposure to alternative disciplinary perspectives or the acquisition of attributes that enhance employability.

An additional layer of flexibility is added by offering themed groups of modules that build into a 'minor', which can become a named part of the degree award. A series of minors are being developed. Some of these are discipline-based, based on a combination of modules that introduce students to core aspects of the discipline and to modes of thinking within the subject area. Others are based around general themes, and foster interdisciplinary approaches to topic areas. Some minors are based on combinations of cognate CI modules.

The modules that make up a minor are pre-specified in advance, and given formal academic approval within owning Faculties. In order to qualify for a minor, students must complete (and pass) a set of modules across the three years of their programme, choosing from an approved list. Qualification for a minor depends upon the range of modules that students have taken, but the decision to include the named minor within the award title is taken *ex-post*. In other words, the award of a minor is based on credit accumulation of the stated modules.

7 Summary

In reporting on a JISC project on curriculum design, Beetham (2012) indicates that:

'The ultimate goal has always been to enhance the curriculum offer, making it more responsive to new markets and needs, more sustainably delivered, more flexible, and more attuned to the capabilities required by graduates in the 21st century.' (page 3)

Innovation in curriculum design can thus be focused on many different areas, depending on the starting point for a particular institution. This paper has explored the experience of one institution and the challenges that it faced – and continues to face – in driving curriculum innovation. The particular path followed may not be appropriate for institutions that find themselves in a different initial position. However, there are some common themes to be highlighted:

Strong leadership and support: the initiative for curriculum innovation was embedded in University strategy and given strong support (including financial support) from senior management.

Student engagement: students were involved in discussions and engaged with the steering group for the start, and were consulted regularly through focus groups and surveys.

Planning and phasing of implementation: careful plans were drawn up to phase in the introduction of innovation so that it was based on solid foundations.

Incentives: it was recognised that the success of the programme rested on there being appropriate incentives in place for individuals to participate. A particular challenge was in the area of the financial model and workload management for staff to devote their time and energies to the programme. This remains a challenge in some areas.

Communication: having a communications plan and a team to implement it were crucial. The need to keep students, academic staff and colleagues in professional services was recognised from an early stage.

Perhaps most importantly, the curriculum innovation initiative captured the imagination of students and the enthusiasm of staff for enhancing learning and teaching and the student experience at a time when the HE sector was going through a difficult and sometimes traumatic period.

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