Reflections on Developing a Cross Faculty Web Science Undergraduate Programme

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Abstract

In this paper we will look at the new Undergraduate Web Science degree at the University of Southampton, briefly set out its structure and content and then go on to articulate some of the challenges and hurdles that were faced in its construction. Although set in the context of a UK Higher Education institution we believe that the highly interdisciplinary nature of Web Science would mean that many of the issues we raise will likely be quite widely encountered. Author Keywords

Web Science; programme development; undergraduate.

Introduction

The University of Southampton has been engaged in Web Science education since its inception in 2006. The Web Science Doctoral Training Centre has been in operation since 2009 and the Masters programme is currently molding its fourth cohort of students.

Through the continuing evolution of this Masters programme we have begun to clearly articulate what we believe Web Science to be in Southampton. We make no claims that this can be seen as a Universal description of Web Science but it does reflect key concepts that we feel are most important and are put at the heart of our curricula.

The Web is socio-technical – In order to fully understand the Web it is necessary to consider it as a co-constitution of technology and society, drawing on social theory concepts such as performity and heterogeneous actors [1].

Web Science is interdisciplinary – Web Science is about tackling big complex questions for which individual disciplinary perspectives are often not adequate. As a result part of Web Science education is about offering insight into a range of disciplinary perspectives, theories and methods, and understanding how they can be integrated in order to provide new understandings of Web and Society.

Web Science must be a critical discipline – In order for Web scientists to critique the current Web's immutable mobile formation it is necessary to have a wide range of methods at their disposal [1].

With this philosophy underpinning our ambitious we created the UG programme very briefly outlined in the section below.

Curriculum Overview

Southampton's BSc Web Science programme is a three year programme with, at present, two distinct pathways, BSc Web Science (Computer Science) and BSc Web Science (Social Science). Full details of the curriculum can be found on the Web[1] but here we will quickly highlight those parts most relevant the discussion following.

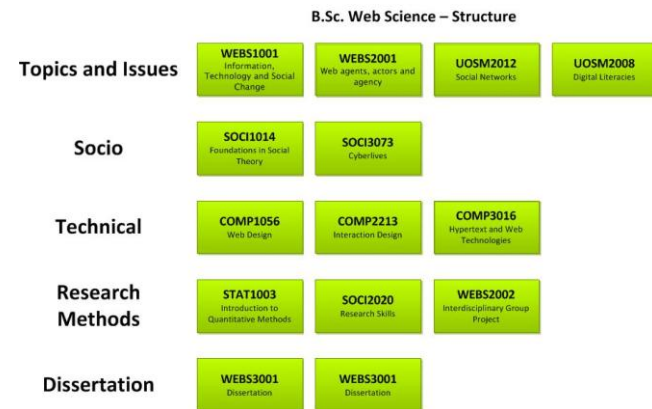
[1] www.southampton.ac.uk/webscience/

Figure 1. Structure of core components.

Just over half of the modules across the three years are considered Core to the degree and will be taken by all pathways. Figure 1 illustrates the structure that has informed our thinking in the organization of the modules.

Working from the bottom, a large dissertation component supported by qualitative and quantitative methods modules underpins are belief in Web Science being a critical discipline. Modules such as Web Design, Hypertext and Web Technologies, Foundations in Social Theory and Cyberlives provide the socio-technical building blocks upon which to develop the integrative interdisciplinary piece. This is carried out through a number of purpose built modules on Technology and Social Change and Web agents, actors and agency, as well as more topic focused modules on Social Networks and Digital Literacy that provide applied perspectives on some key Web Science areas.

Pathway	Modules
Comp Sci	Programming I, programming II, Databases and Applications, CS option.
Soc Sci	Sociology of Everyday Life, Political Theory, Transformations of the Modern World, Social Theory.

Table 1. Pathway specific modules.

In addition to the core modules, the two pathways each have a set of additional compulsory modules that provide deeper theoretical underpinnings in key areas. These are listed in Table 1.

Beyond the compulsory modules, students will have the opportunity to take a wide range of optional modules from Faculties across the University, giving them a chance to special in areas that are of most interest to modules on Law, Management, Economics, Criminology, Demography, Maths, Geography…

This curriculum is certainly going to be challenging, expecting a wider range of aptitudes than a more individual disciplinary course might. The remainder of this paper though, will briefly discussed some of the challenges that we faced in the construction of the Web Science UG degree, some of which might be specific to the UK or perhaps even our institutional context, but our belief is that they reflect some more general issues about Web Science, in common with many interdisciplinary pursuits, may be a disruptive force for change in Higher Education generally.

Process and Pragmatics

Reduce, Recycle and Reuse.
In the construction of this degree it was evident that foundational material was already going to be existence in the Faculties participating. Students will need some understanding of core sociological theories and understanding of various technical aspects of the Web. Where possible we have made use of existing modules with an appreciation that these may need some modification if possible. This might include the tailoring of modules to incorporate more Web-based exemplars or case studies or inclusion of relevant work from the Web Science academic literature.

One key issue that has been identified however is that certainly in the near future, as the cohort of Web Scientists is hopefully steadily growing, they may well find themselves in the minority in many of their modules and in addition sharing them with a variety of other cohorts in different degrees. For this reason, cohort cohesion is a potential concern and the new Web Science bespoke modules along with more traditional tutorial support, will be providing the clue to help make this feel like a coherent degree. This is an identified issue and will be monitored closely during the first year of the programme.

Silos at every level
A second key issue faced, and one likely to be true of many interdisciplinary programmes, is the historical silo structure of many academic Institutions. Issues were encountered at all levels running from teaching allocation cross Faculty, through to administrative support, marketing and outreach. In the large, these were not generally insurmountable and mostly came from a position of "this is different to how things normally worked".

Southampton University has a clearly articulated vision of transforming education through a "multidisciplinary approach" but translating this into strategy will require the remolding of existing structures and systems and Web Science is perhaps at the vanguard of some of these changes. It should be noted though that these types of issues weren't limited just to internal structures however. UCAS, the UK undergraduate application process, identifies degrees by a single code,

akin to the duodecimal library system and here, Web Science becomes problematic to pigeon hole. A key part of overcoming these challenges turned out to be communicating clearly what Web Science is to those not already engaged in the emerging discipline.

Many messages for many people
During the construction of the UG programme we regularly needed to communicate what Web Science is, to people at all levels of the University. To peers in Faculties in programme committees, to administrators in the University dealing with the pragmatics of constructing new programmes, to admissions teams trying to understand entry requirements and Open Day needs, to marketing and outreach teams trying to get the message out to Schools etc. The shorthand we have grown accustomed to using to communicate what Web Science is to academic colleagues didn't always translate to those that wanted to relate it to courses that they were already familiar with.

Recruiting students who haven't yet studied Web Science
The final piece we'd like to note is that Web Science at undergraduate level is still likely to be a hard sell. Although gaining some traction in academia and industry, but certainly in the UK, many prospective undergraduate students will not be aware of what it is. Furthermore, the message needs to be put out to teachers and HE advisors that Web Science is something that can and should be studied at undergraduate levels. Part of the task is developing new methods to describe what Web Science is and why it is important. We need convince them that there are jobs at the end of this degree which means defining what a Web Scientist is, who will employ them, what types of jobs will they do. Students, and importantly perhaps parents will want to know this before making a decision and those messages don't exist out there as they do for more traditional degrees such as Computer Science for example. The broad interdisciplinary approach we take undoubtedly makes this harder in some respects as a sales pitch.

Conclusions
The construction of an Web Science programme from an pedagogic perspective has been the subject of a number of papers at previous Web Science curriculum workshops and is by no means and easy task in itself. What we have sought to present here are some of the additional challenges that the creation of an entirely new degree programme in the space creates.

Acknowledgments
Putting together an undergraduate programme is clearly the work of too many people to be able to acknowledge here, however we would like to thank those at all levels of the University that have contributed, advised and facilitated along the way.

References
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