The Role of the Web Science MSc in Preparing For Research

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Abstract

Since 2009 the Web Science Doctoral Training Centre at the University of Southampton has offered an MSc in Web Science as the first year of a four-year integrated PhD in Web Science. The course is interdisciplinary and skills based, with the prime role of preparing students for a three year PhD in Web Science. This paper explores student feedback regarding the Msc, examining the positive elements of the course as well as the challenges faced by web science students.

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Introduction

Since 2009 the Web Science Doctoral Training Centre at the University of Southampton has offered an MSc in Web Science as the first year of a four-year integrated PhD in Web Science. The course is interdisciplinary and skills based, with the prime role of preparing students

for a three year PhD in Web Science. The course covers the fundamental technologies of the different generations of the Web, but also places a strong emphasis on exposure to many different disciplines and combining them in an interdisciplinary approach, culminating in a dissertation with two or more supervisors from different faculties.

The Web Science MSc focuses on the development of transferable skills to allow students to understand the web from an interdisciplinary perspective. During the course, students are introduced to key research questions within the field, introduced to the technical foundations of the web and how it works before examining the role of society in both shaping and being influenced by technology. Students are introduced to appropriate methodological approaches and the skills required to conduct research before undertaking their own independent work.

Project and Dissertation		
Research Methods	Research Design	
Computational Thinking	Social Science and Humanities Thinking	Interdisciplinary Thinking
Hypertext Web 1.0	Social Web 2.0	Semantic Web 3.0
Foundations of Web Science		

While it is common practice to evaluate courses through student reaction and student assessment it is less common but equally important to evaluate the long term contribution of courses to students' progress. The first (2009/10) cohort are now in final year of their PhD, with members of every cohort currently studying at Southampton. Considering how the MSc has prepared each cohort for the undertaking of a PhD is now timely, and could provide insight into broader Web Science education.

Method
This study examined student feedback from members of the Web Science DTC. All students were contacted by e-mail with an open question. For current PhD students this was: **How has the MSc prepared me for doing my PhD?** For current masters' students this was adapted to: **How do I think the MSc will prepare me for doing my PhD?**

Respondents were encouraged to reply with between 100 and 200 words, considering how the MSc has helped or will help them and also how it might have assisted more. Otherwise there was no guidance. Thematic analysis was conducted on the gathered responses.

Results
Respondents were encouraged to identify areas where the course could have supported them better, however all but two of the responses were positive and focused on how it had supported them. Interdisciplinarity was the dominant theme, being present in all responses. It was viewed as the defining feature of the course. Some

respondents emphasised the content of the different disciplines to which they were exposed: "*Coming from a teaching background via information systems I had very little knowledge of sociological perspectives which have changed the way in which I may approach a question*" Others emphasised the range of research methods: "*The MSc exposed me to a whole new area of analysis and research methods, and as such I was able to introduce a new dimension to my research".* These ideas were repeated throughout responses: "*By giving me a very varied sample of different disciplinary approaches, I am more comfortable attempting to do interdisciplinary research*".

These respondents clearly highlighted that the interdisciplinary approach had made a substantial, possibly essential, contribution to their research. However, some students also raised concerns about the interdisciplinary approach. These mostly focussed on frustration that in covering so many subjects it was not possible to cover the subjects that interested them in enough depth. They were "*never delving deep enough*" to gain a full understanding of disciplines, but rather gaining "*a shallow understanding of a broad range of subjects*".

This frustration was closely linked to a desire that the masters course should "*be more tailored to individual students",* especially for those who were aware of the topic they wish to investigate further: "*I fail to see how some units will be of use to me*". One respondent commented that the course "*Could have helped me more if it had been more tailored to my interests and requirements."*

Other emergent themes were the importance of the support from the other members of the cohort with their varied backgrounds, particularly in an interdisciplinary context: "*the Web Science MSc helps you .... integrate the skills, thoughts and approaches that everyone else on the cohort brings to the table*"; and the value of the course in general, and the dissertation in particular, for offering an opportunity "*to research many different areas and decide which ones are best suited for my PhD*".

Discussion
None of the emergent themes were surprising or new. They have been the subject of discussion in Web Science education during informal cohort discussions and were recognised in the design of the course. The study does however help to identify which ones are likely to have the most impact on students' subsequent experience and some of the issues in optimising that impact.

Interdisciplinarity is fundamental to Web Science and is likely to feature in a wide range of Web Science education offerings. The key issue that emerged was the need to cover a wide range of subjects while providing an opportunity to study some subjects in sufficient depth. Some students suggested providing more options: "*Possibly, there could be more options in the later terms to specialise in particular areas*". While this might sound attractive it has some significant drawbacks. There are practical issues in offering choice based education for what are likely to be very small groups. Also the support of the cohort was an important theme and presented another way of gaining interdisciplinary skills, encouraging interactions with "*other members of the cohort with different academic*

backgrounds, and different aspects of life experience", providing multiple options may dilute the identity of the cohort and limit this interaction. Although any group can develop relationships between members, the multidisciplinary mix apparent within Web Science has acted to improve the accessibility of disciplinary approaches allowing individuals to learn from others and enable *"skills swapping, filling in gaps in (my) knowledge".* One respondent summed this up as *"Having a cohort around for support has also been invaluable".*

The best response to a learning need is not always formal education. The course includes several features to facilitate cohort support such as extensive group work, social events and a coffee area dedicated to current and past students to encourage interactions between students and facilitate the potential to learn from members of the cohort. The dissertation project provides an opportunity for students to study specific disciplines in more detail and practice the skills they have developed. Having supervisors from multiple disciplines allows students to explore chosen subjects under experienced guidance.

Conclusion
The range, fluidity and volatile nature of Web Science makes it a major educational and training challenge. Many other disciplines have refined curricula over decades of experience. Web Science does not have this luxury. Opportunities to learn from past offerings need to be valued and acted on as quickly as possible. Most

educational institutions have processes in place for students to comment on their experience of the course at the time that they are taking it. Such methods are often advantageous compared to examinations and other formal assessments which despite being valuable tools for evaluating courses as regards learning outcomes do not allow for the investigation of student experience. Processes for evaluating education after the skills and knowledge have been put into practice are less common and typically less rigorous. Although such studies are likely to be tailored to the students' working environment, they also reflect more closely the real value of the course. Hopefully lessons such as the real value of an interdisciplinary approach can be extrapolated to the other courses leading to similar working environments.

A very short study like this naturally has several key limitations. Only a third of students responded, presenting a self-selecting sample. Those with a strong interest in education and developing the masters' course were more likely to respond. The research team were also current students of the course, known to the other students and this may have affected both the responses and their analysis. A significant weakness is that an e-mail response is likely to be superficial. Work is required to expand this study to examine the issues raised in greater depth. Quantitative and qualitative approaches, such as a structured questionnaire or a series of interviews with the students are both valid approaches that should be considered.