Food Systems: A Multidisciplinary Approach to Analysis and Learning

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Abstract

This paper introduces an innovative, interdisciplinary food systems programme based on an open-source pedagogical model that facilitates learning through the use of technology developed at the Universitat Oberta de Catalunya (UOC). We begin by explaining the structure and goals of the UOC and briefly introduce the UOC's e-learning model. We then consider the development of the Department of Food Systems, Culture and Society and explain our rational for focussing on food governance. We focus primarily on a set of mandatory introductory courses for the Master's Diploma in Food, Society and International Food Governance. These courses, which make up a certificate in Food Systems Analysis, lay out the fundamentals of our approach to the study of food systems. Finally, we consider an analytical framework used to examine the socio-political context of contemporary food systems. Here, food systems are approached as an arrangement of activities clustered around trade liberalization, neoliberalized social formations, and a condensed state, which produce complex forms of food governance.

1   Introduction

Today, societies are increasingly characterised by rapid change. Agriculture and food are not immune to these changes; in fact, they are deeply impacted by them. From climate change to shifting demographics, from new technologies to new social movements, our food systems are in flux. As an added level of complexity, food systems are entrenched in an interconnected web of ideology, value, culture, tradition, science and ecology. The dynamics of these systems complicates research, analysis and development of sustainable operations. They also make it essential to use integrated and multidisciplinary approaches that are congenial with a systems approach. In this context, the Universitat Oberta de Catalunya's (UOC) International Graduate Institute has launched the Department of Food Systems, Culture and Society. Through this department, we are developing interdisciplinary courses dedicated to the study and analysis of food systems.

We conceptualise a "food system" as an organization of production, processing, distribution, selection and consumption of food. Broad and cross-cutting, "food systems" as a framework allows us to expand the scope of inquiry to include issues linked to land, economy, power, production, processing, regulation, history, culture and politics.

Too many approaches to the study of food and agriculture have tended to focus on singular (seemingly self-evident) categories of food (i.e., [processing], [health], [safety], [production], [inspection], [trade], [consumption]) (Lien 2004), but these activities are integrated and interconnected. Agriculture and food have always stretched over boundaries of ecology, culture, politics, trade and labour (to name a few). By focusing on a single issue, we do not always grasp the systemic character of the problems we face and consequently miss opportunities for integrated responses (Henderson 2000:176). Given the magnitude and complexity of the problems facing our food systems, developing integrated systems perspectives is fundamental to ensure sustainable strategies. It is thus helpful to think of food

systems as webs: when one strand of the web is weakened or neglected, the entire web is in turn weakened, but when all parts of the web work together, the strength of the web increases. Similarly, within food systems, if one component of the system is weakened, the rest of the system is impacted. When soil nutrients are depleted, plants suffer. When plants are cleared from an area, the wildlife tends to leave as well, changing the ecological balance.

Food systems are always embedded in social organizations, ecosystems and institutionalised relations of governance and it is through these relations that food becomes politicized: the organization of food systems impacts who eats and who does not, as well as what we eat and what we do not eat. The dynamics between actors are sites of tension and the challenge then becomes to develop integrated strategies to forward sustainability amidst these sites of tension.

The intricacy of the food web is part of the joy and the power of food. The diversity of crops, animals, tastes, smells and rituals play a fundamental role in cultures and are often linked to pleasure. But this diversity and complexity also makes it challenging to fully understand and to develop alternatives to the problems facing our food systems. The complexity demands integrated approaches that are interdisciplinary, creative, and grounded in the three pillars of sustainability: social, environmental, economic. Developing learning opportunities that follow this approach and that promote critical thinking in the area of food systems is the goal the Department of Food Systems, Culture and Society.

2   The Universitat Oberta de Catalunya: The University of the Knowledge Society[1]

The Universitat Oberta de Catalunya (UOC) is an online university based in Barcelona, Spain. The UOC established itself in 1994 as the world's first 100% online, accredited university and has since grown to a community of almost 60,000 students, faculty, staff and alumni. The UOC holds the UNESCO Chair in E-Learning: a collective space for reflection and interdisciplinary analysis of the changes in educational institutions that emerged from the introduction and use of e-learning.[2]

The mission of the UOC is to provide people with lifelong learning and education opportunities outside of the constraints of time and place. In the 2010-2014 Strategic Plan, the UOC reaffirms its commitment to a core set of values. The UOC is committed to openness: open to people, to ideas, to culture and to the world. The UOC is a university that forwards accessibility, mobility and open software. For example, our learning platform is open source. As well, the UOC strives for an open mentality that translates into a positive attitude and is receptive to new and different approaches to learning, teaching and researching. The second value is flexibility. This means the flexibility to adapt to different environments and to the needs of society. It also ensures flexibility for its staff and students through mobility and knowledge transfer. The UOC is committed to being a network and defines itself as the network university to the network. This means making use of information and communication technologies (ICT) to facilitate networking. The University is dedicated to quality in its educational offerings and also as cultural institution. Another value is to have the

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1.   This section draws from institutional documents, reproduced online here: http://www.uoc.edu/portal/english/la_universitat/coneix_la_uoc/presentacio/index.html

2.   For more information on the UOC UNESCO Chair in E-Learning see http://catedraunesco.uoc.edu/portal/english/catedra_unesco/web/presentacio_institucional/rao_de_ser/index.html

activities of the UOC oriented towards students. The UOC is also committed to innovation transverses. Finally, the UOC is dedicated to social responsibility which is reflected in a commitment to work towards a sustainable university, with transparency in accountability. These values, notably those of openness, innovation and social responsibility, ground the Department of Food Systems, Culture and society and influence the design our of programmes.

The Department of Food Systems, Culture and Society is part of the UOC's International Graduate Institute. The International Graduate Institute is has the mission of promoting accessible e-learning that is open, innovative and up-to-date range to ensure the successful development of our students in technological, international, innovative and flexible environments. The Institute makes use of information and communication technologies (ICT) to make knowledge more accessible. Efforts are also made to ensure that technological resources facilitate individuals' lifelong learning, while complementing their professional and personal situation. Finally, the Institute has set itself an international and multilingual goal of achieving better cooperation and development throughout the world, beyond countries, cultures and languages.

The UOC fosters cooperation and exchange within the university community and with other universities, institutions, the business community and civil society. The UOC is also forging international alliances to enable sharing and learning and through the Global Campus, an English version of the UOC's Catalan and Spanish online campuses.

Towards this end, the Department of Food Systems, Culture and Society, is developing several alliances and agreements. The natures of these partnerships vary. For example, we have signed an agreement with the University of Missouri's Food and Agriculture Policy Research Institute (FAPRI) formalises our commitment to share resources and to support each other's initiatives. With Michigan State University's Institute for Food Laws and Regulation (IFLR) we have developed an agreement for credit recognition that allows UOC students to take IFLR's online food regulation courses for UOC credit and recognises the IFLR certificate as equivalent to a UOC specialisation (four months, 15 European Credit Transfer and Accumulation System (ECTS) credits[1]).

We are also finalising an agreement with the Food and Agriculture Organization of the United Nations (FAO) to integrate existing FAO e-learning courses into a university accredited programme. The partnership will be launched in March, 2010 with *Food Security: Assessment and Action*, a four-month certificate programme. The majority of the materials used in the course come from the European Union funded e-learning course *Food Security Information for Decision Making*.[2] Our certificate puts these lessons into the UOC's virtual campus and employs teachers to guide students through the readings, coordinate activities (e.g., debates, discussions, assignments) and evaluate students continuously for the duration of the certificate. Students who complete the programme receive a *Joint UOC-FAO certificate in Food Security: Assessment and Action* and 15 ECTS credits which can be transfered to our Master's in Food, Society and International Agri-Food Governance.

An important component of this certificate is the forum for food security practitioners to interact with one another. It is important that individuals working on food security projects

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1.   Our programmes are part of the European Credit Transfer and Accumulation System (ECTS). ECTS is a standard for performance and accomplishment at the level of higher education across the European Union. For more information, see: http://ec.europa.eu/education/lifelong-learning-policy/doc48_en.htm

2.   These courses can be viewed here: http://www.foodsec.org/DL/dlintro_en.asp

not only have access to the more academic training and knowledge but also the opportunity to work, discuss and problem solve with each other through the UOC's interactive Virtual Campus. Indeed, at the UOC, peer-to-peer learning makes up a fundamental component of our pedagogical model. These interactions are supported in our virtual classrooms in what we call "hallways" – virtual spaces where students can interact – as well as in our classrooms, where students and teachers can ask questions and work through problems.

3   E-Learning Model

The UOC's educational model has been in development since 1995 and is constantly being evaluated and reworked to remain current and inline with technological advancements. Learning activities are at the centre of our educational model (see figure 1). Students are supported in their learning by three main elements: resources, collaboration and accompaniment. Resources include the content, spaces and tools necessary to carry out the learning activities and their assessment. Collaboration refers to the set of communicative and participative dynamics that favour the combined building of knowledge among classmates and teachers, through teamwork to solve problems, develop projects and group product creation. Accompaniment is the collection of actions carried out by teaching staff to monitor students and to give them support in planning their work, resolving activities, assessment and in making decisions. Through out their studies, students engage in one-on-one interaction and have continuous guidance from the teacher.

Figure 1. UOC's Educational Model

More information about the UOC's innovative educational model is available here: http://www.uoc.edu/portal/english/la_universitat/model_educatiu/introduccio/index.html
The UOC's educational model is flexible insofar as it is open to the implementation of a diverse range of learning activities in accordance with the competences worked, the area of knowledge and the specialisation. Correspondingly, the dynamics and resources associated with these activities also need to be diverse, heterogeneous and adaptable to a large range of learning needs and situations. In this regard, the UOC is committed to providing the learning activity of the student with the most advanced technological and communication elements, including social tools that facilitate collaborative work (blogs, wikis, social markers, etc.), advanced communication systems, both synchronous and asynchronous, which provide flexible and clear communication adapted to each situation (videoconference, collective

intelligence systems in forums, etc.), and access to teaching through mobile devices to support mobility.

The UOC's educational model has been designed so as facilitate personalisation to better meet the needs of our students. Figure 2 outlines one variation of the educational model that focuses primarily on resources (such as scholarly articles and ICT tools) and on collaboration with various work teams. The UOC tutors (teachers) are in the classroom to support students, to guide them through the materials as well as to ask and answer questions. Students are also supported (accompanied) by a counsellor who supports them with technical and administrative concerns throughout the course of their degree.

Figure 2. A Personalised Educational Model
Source: UOC Educational Model Presentation, available:
http://www.uoc.edu/portal/_resources/EN/demos/model_educatiu/index.html

4   Department of Food Systems, Culture and Society

The Department of Food Systems, Culture and Society was established as part of the UOC's Global Campus. The Global Campus is an initiative to expand the UOC's mandate and reach by offering innovative postgraduate courses in English. Given the growing interest in food and the increasing recognition of food studies as a scholarly discipline along with Catalonia's culinary tradition and growing gastronomic reputation, a food studies programme seemed apt.

Faculty and academic advisors to the programme noted a need for courses dedicated to explaining and analysing food regulations and regulatory agencies. There is especial need for a social science perspective given the significant role that these regulations play in every society. As a result, we agreed that developing scholarship in this area provided an important opportunity.

The UOC also considered the changing economic environment that began to change rather dramatically as we started to frame the programme in the fall of 2008. Faced with increasing economic uncertainty, focussing on a more pragmatic offer, such as food regulation, seemed sensible.

Consideration was also given to the type of students that the UOC tends to attract. The UOC's student body is not like that of a more traditional university. Almost 40% of UOC students are between 31 and 40 years of age and just under 80% of them work full time. The majority of our students are coming back to school looking for flexibility in education so as to enhance their skills and qualifications for work-place advancement. As a result, they tend to be highly motivated and eager to learn and participate. This motivation is fundamental to our educational model.
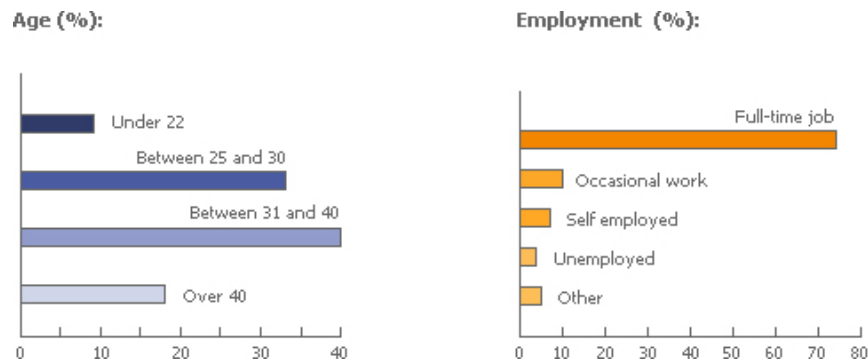

Figure 3. UOC's Student Profile: Age and Employment
Data from academic year 2007-2008, available:
http://uoc.edu/portal/english/la_universitat/coneix_la_uoc/uoc_3min/index.html

Finally, Pintauro *et al.* (2005) concluded that college-level online courses in food safety and regulation are as effective as traditional lecture-based training methods. It is of interest to note that their study concluded that a combination of web-based learning and face-to-face lectures were viewed most positively by students.

From this starting point, Food Systems faculty developed a programme framework and began approaching experts to author courses and to work with us as advisors.[1] These authored courses make up our core learning materials and are central to the resources node of our educational model. In the Department of Food Systems, Culture and Society, the authors of the courses are usually the tutors (teachers). However, in some instances, the expert is available to design and author the course but cannot teach it. In this case, we work with the author to find a suitable teacher (likely a PhD student or colleague).

The UOC has also established an international and interdisciplinary team to act as an International Academic Advisory Committee. The Committee met in Barcelona in May 2009 to review the programme structure and curriculum. With this interdisciplinary team we solidified the framework for the Master's in Food, Society and International Food Governance. The Committee continues to share ideas and information through a private listserv and they are regularly updated with the development within the programmes.

Within the Department of Food Systems, Culture and Society we are developing three key areas of study: Food Systems; Food and Territory; and Agro-ecology. Each of these areas approaches the study of food with an interdisciplinary approach that is grounded in the social

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1.   UOC courses are authored by experts, usually faculty from other Universities. The courses are then taught by either the authors or other qualified persons when the author is unavailable. These people place a key role in the accompaniment and resource nodes in our educational model (described above, see figure 3).

sciences. The Food Systems area is the first to be developed and is currently the core of our programme.

The Food Systems area is built up around the Master's in Food, Society and International Food Governance. This Master's is a 2 year part-time degree programme worth 60 ECTS credits. The UOC's commitment to open education means that anyone with a good grasp of English and access to the internet is eligible to take part in the Master's programme, so long as they can afford the tuition. Students who do not have a recognised university degree will receive an equivalency certificate in lieu of a postgraduate degree.

The Master's in Food, Society and International Food Governance has been designed for individuals interested in enhancing their understanding and analysis of agriculture and food policy and increasing their understanding of the social, cultural and economic factors that influence and shape the development and enforcement of agri-food governance. This combination presents an opportunity to explore connections between the historical, political, scientific, strategic and ethical considerations involved in the organisation of food and agriculture internationally.

Master's in Food, Society and International Food Governance 60 credits, 2 years (part-time)			
Postgraduate Diploma Food Systems and Governance* 30 credits, 1 year (part-time)			
Food Systems Analysis* 15 credits, 4 months		International Agri- Food Policy* 15 credits, 4 months	
Students must select two electives (total of 30 credits)			
Food and Society* 15 credits, 4 months	Food Security: Assessment and Action* (with FAO) 15 credits, 4 months	Food Regulation * (with IFLR) 15 credits, 4 months	Geographic Indication* 15 credits, 4 months

Figure 4. Framework for the Master's in Food, Society and International Food Governance
* These programmes can be taken independently from the Master's degree or the Postgraduate Diploma.

The Master's in Food, Society and International Food Governance (represented in figure 4) is made up of a mandatory Postgraduate Diploma in Food Systems and Governance. A Postgraduate Diploma is a two semester-long, 30 ECTS credit programme. Each semester is

made of up of a certificate programme, which we call a Specialisation. The Postgraduate Diplomas and the Specialisations can be taken independently from the Master's and can later be applied to the Master's degree should the students wish to continue their studies. The two Specialisations that comprise the Postgraduate Diploma in Food Systems and Governance are Food Systems Analysis and International Agri-Food Policy. Once students have completed this Diploma they can choose from two of four elective Specialisations: Food and Society; Geographic Indications; Food Regulation (with the Institute for Food Law and Regulation, Michigan State University); and, Food Security: Assessment and Action (with FAO).

The Specialisation in Food Systems Analysis lays out the fundamentals to a food systems approach. The Specialisation provides students with a comprehensive understanding of food systems in a local, regional and global context and lays out an approach for a more complete and holistic analysis of food systems. Central to the course is understanding the relationships between economics, environment, society, culture and agri-food policy.

The course starts from the premise that food systems are shaped by competing worldviews and mediated by relations of ruling that are often organised through policy programmes. Understanding the organization of the relations of ruling is central, not only to understanding how agriculture and food are organised and governed, but also so that we may develop more sustainable policies and practices and forward healthier food systems. By highlighting some of the less obvious ways in which food is politicised, we can contribute to "a more nuanced understanding of both politics and food" (Lien 2004:9).

The Specialisation in Food Systems Analysis is broken down into four modules: Food Systems Analysis; Trade Liberalisation and Food Governance; Research Methods; and, Contemporary Issues in Food Studies. The first module qualifies the inherent complexity of food systems and presents a systems approach as a way to understand food systems in a more holistic way. Within the course, a "system" is defined as an interdependent group of items forming a unified whole. Students are introduced to systems methods including specific techniques and applications such as system dynamics.

To carry on with our web metaphor, the systems approach helps us understand what connects our food systems and holds it together. It allows us to extend our analysis beyond a single issue. This module is a response to the need for approaches to analysis that can grapple with the growing complexity of our food systems. This course looks at the origins of systems thinking which go back to ancient Chinese philosophy but notes that the principle characteristics emerged in the early 1920s, and formalized in the 1950s applied to biology, physics and ecology, economics, psychology, sociology, and management sciences. Systems thinking is presented as an approach that moves away from reductionist or mechanistic approaches to a more holistic approach, where the essential properties of any system are its properties as a whole, and are not represented individually by any singular part.

The second module examines contemporary agri-food governance and highlights three factors that play a central role this process: trade liberalization, neoliberalism and the changing nature of the state. Understanding the key factors that influence governance ensures a more comprehensive analysis of the governance of our food systems. To define food as a political object is to draw "attention to the fact that many relations that are constituted by and through the medium of food are also power relations and should be analysed as such" (Lien 2004:9). Understanding and politicising the factors involved in making up food governance is central to understanding the relations of power that mediate

our food systems. It also provides us with more insight into the tensions that hold our food web together. We will return to this as it is the central theme of this paper.

The third module provides a survey of research methods that are common in food studies. In this module research is defined and time is spent discussion the role of bias in social research. Students then review the how to frame a research question and how to design a research project. Methods for undertaking social research are reviewed and particular focus is paid to Institutional Ethnography, a materially grounded approach to social research that articulates the organisation of power through textually mediated relations of ruling (i.e., policy). This module also reviews academic referencing and citation.

Finally, students review central themes in food studies from a specific standpoint, that of Slow Food. Here, the idea is for them to apply the learning that they have done in the previous modules to analyses of issues such as biodiversity and genetic modification. This final module is an opportunity for students to share opinions and experiences and to learn about what one important international food organization is doing to advance the values of good, clean and fair food.

5   Examining Agri-Food Governance

As noted, central to this specialisation is the presentation of a framework for approaching analyses of agri-food governance. The era of neoliberalism that arose in the late twentieth century has been pivotal in transforming contemporary food systems.This involved agreements regarding agricultural trade liberalization, reconstruction of the state and a new array of food national, science-based governance practices. In this section, four clusters of activity that were prominent in that transformation are examined and a theoretical framework for analyzing the socio-political context of this transformation is proposed. Each of the four clusters of activity play a significant role in the power complex that shapes and is shaped by contemporary food systems. A defining feature of the relation between the four is a tension between agricultural trade liberalization and food governance as seen, for example, in food safety. The relation of these four activities can be illustrated as follows:
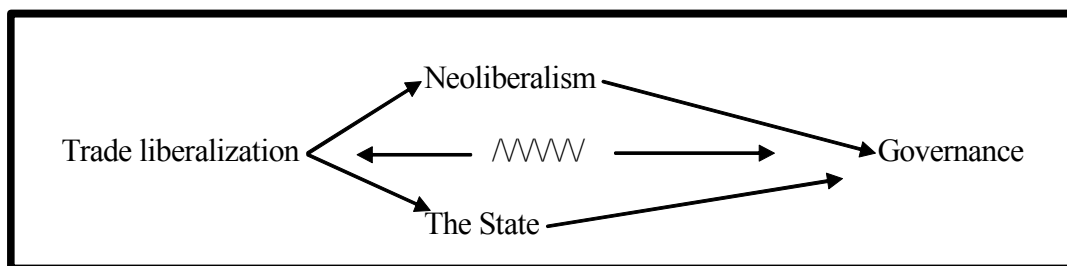

Figure 5. Tensions in Food Governance

It should be noted at the outset that these topics involve densely interconnected forces and are not discrete categories. They are amorphous and filled with a variety of personal, organizational and social networks. Trade liberalization, for example, is an internationally organized project for re-organizing the way in which economic (market) activities are conducted within and between social formations (societies). The intent behind it is to reduce regulatory or other barriers to trade. This is based on the rationale that social formations (and the corporations within them) expand as they are able to use international trade to an

advantage. The pursuit of trade liberalization reflects the rise of neoliberalization, pursued primarily from within developed countries. Nevertheless, a country may promote trade liberalization in order to expand its agricultural exports while, at the same time it attempts to protect its own domestic agricultural production from liberalized trade with other countries.

Neoliberalism is used here as more than an ideology. Instead it designates a particular historical arrangement of power—as denoted by the term, "a neoliberal era". This reflects the fact that contemporary social formations revolve around the leadership of a power structure that operates through the use of coercion and the organization of consent within a social formation. This is by no means a stable process and is usually filled with antagonism and resistance.

The third key topic, the state, is used here to refer not only to a legal and regulatory framework of political entities, but also to a variety of political engagements that occur within its jurisdiction as well. The state is not only a national system of authority, but includes other jurisdictions and a large number of "arms-length" and non-governmental organizations that operate within its auspices. In neoliberal social formations, the role of the state as a regulator has been greatly reduced, which brings us to food governance.

Food governance commonly occurs through the coordination of the state. It reflects, in many ways, trends that can be seen in trade liberalization, neoliberal social formations, and the state. Food governance involves regulatory mechanisms relating to agriculture, food and health that are politically organized and sanctioned within a social formation.

Because of significant differences in culture, history and social organization, each of these will vary from one area to another. In fact, the socio-political context needs to be seen as a complex set of disjunctive social relations. That is, the four areas of social activity are not organised or operatedd in similar ways. For example, the push for trade liberalization and the state are both social activities but quite different as phenomena to understand. This applies, as well, to food governance, neoliberalized social formations and to the larger socio-political context which these four domains comprise. For this reason, a sociological approach, which is more congenial to interdisciplinary analysis is preferable because it focusses on a more generic sets of social relations than political organization or the economic activity of markets. Put another way, sociological analysis provides a means of relaxing the assumption of a unitary object of investigation that is less possible in those other disciplines.

The UOC framework course provides a vocabulary and conceptual scheme for examining agri-food governance that revolves around four disparately structured forms of social activity: trade liberalization, the project of global capitalism, the nation-state and its specific regulatory arrangement. The module in Food Governance and Trade Liberalisation invites people to develop these notions around their own particular location in the food system(s) around them.

6   Conclusion

The UOC has developed the Department of Food Systems, Culture and Society as part of its commitment to innovative, open, socially responsible education that tackle important social problems. The UOC is a network university that relies on open-source technologies to connect students and faculty and advance knowledge. This organisation supports multi-disciplinary learning and research in the area of food systems. As outlined in this paper, such

scholarship necessitates flexibility, creativity and systems approaches. The courses designed in the Department seek to conform to these criteria and to date, the department has designed and developed courses to forward these goals, however, not without limitations and hurdles.

The Master's in Food, Society and International Agri-Food Governance was supposed to launch in October 2009, but due to internal issues and a low number of registered students, the launch was delayed until March 2010. One of the major obstacles we are facing is awareness. While the UOC is well known in Spain, it has yet to develop an international reputation outside of key research areas. We also face stigma as an online university. Students are still uncertain about the quality of such programmes, although this is changing as more and move universities start offering online programmes. Cost has been another factor in attracting students. The tuition for our programmes are in line with existing online courses of a similar nature but cost remains a major reason given by students for not being able to participate.

We have had a substantial increase in interest the March 2010 semester. Much of this interest has been for the new UOC-FAO joint certificate in Food Security: Assessment and Action which has been well publicised on development training websites and through development NGOs.

As we move forward, our main goal is to continue to find ways to attract students and to market the programme. We are also planning a research project into models for participation in global agri-food governance. The idea is to take advantage of the UOC's technology so as to enhance awareness and the exchange of knowledge around issues of global food standards.

In October, 2010, we will launch the Master's in Food, Society and International Food Governance in Spanish. We expect a larger student body for this programme. We also plan to move forward with the development of the two other areas of study: Food and Territory and Agro-ecology.

Finally, we are about to start developing an evaluation of our marketing efforts. We will be developing an online survey to be sent to students who expressed an interest in our programme. The aim is to determine what attracted them to the programme, why they wanted to pursue food studies and what led to them registering or not registering.

Food and agriculture make up the world's largest industry are the world's largest employer. Although food plays such an important role in our societies, cultures, economies and personal lives, few understand how food makes it to our plates. As our food systems face increasing challenges, scholarship grounded in a systems approach will be fundamental to the development of solutions or new ways forward.

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