

D2.2 STUDY VISIT REPORT

WP 2: Capacity Building and Curriculum Development

Project Information

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Reviewed by

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Date	May 2020
Name	Prof. Anil Kumar,
Partner	Asian Institute of Technology, Thailand
Date	May 2020

Cover Image: On Wednesday during the study visit, participants were asked to formulate the Vision and Values and the Programme Outcomes for the FOODI MSc Programme and type these into electronic worksheets. This was done on a group basis. Each of five groups had access to an electronic device at their respective tables, a password to a Gmail account and as they completed the worksheets, these could be visualised in real time on the projector screen in the study visit venue. This also facilitated comparison, collation and consolidation of the Vision and Values statements and Programme Outcomes.

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FOODI Study Visit Participants at University College Dublin, Belfield, Tuesday, September 17, 2019

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Executive Summary

As a partner in the FOODI Consortium, University College Dublin (UCD) hosted a group of visiting academics and administrators from the 14 FOODI Consortium Partner Higher Education Institutions (HEIs) based in Italy, Greece, Malaysia, Cambodia and Thailand for a week in September (16th - 20th, both inclusive) together with Research Innovation and Development Lab (ReadLab P.C.) from Greece as technical support specialists focussed on technology-enhanced learning solutions, quality management in education and design and development of training materials. The aims of the visit were to: 1) demonstrate elements of relevant UCD Programmes, in particular the online MSc in Food, Nutrition and Health and to discuss their transferability to the proposed FOODI Programme, and 2) to work with the FOODI Partner HEIs on the proposed Programme Curriculum Design to ensure it was appropriate to their needs, based on their country and institutional context. Thirty-four delegates participated in a focused week of activities, including key involvement from UCD Teaching & Learning and UCD Innovation Academy units as well as colleagues from UCD School of Agriculture and Food Science and the UCD School of Public Health, Physiotherapy and Sports Science. Emphasis was on striking a balance between being instructive and participative, the latter approach seen as pivotal to successful delivery of an initial Curriculum Design. The visit was structured logically around the Curriculum Development Process used by UCD Teaching & Learning as a systemic means of developing new courses. Participants were initially welcomed to UCD and introduced to the University and then introduce to the Curriculum Development Process. The results of work package were reviewed and outcomes were reported so that the information generated could inform the Curriculum Development Process. Presenters from each partner Asian country talked about the FOODI context in their own situation, with talks framed around a series of key questions relating to the agriculture and food industry, its main products, trade, exports, law and regulations and national culinary stereotypies. An optional tour of both the Food Processing and Food Analytical laboratories was conducted on late Monday and Tuesday afternoons. Participants were engaged by the UCD Innovation Academy in a session of creativity and learning by doing to highlight practical aspects likely to be key to the FOODI Programme. The development of two UCD Master Programmes – the MSc in Food Regulatory Affairs and the online MSc in Food, Nutrition and Health were elaborated. Also, five UCD staff engaged in innovative teaching, learning and assessment strategies presented their techniques to participants. The study visit culminated in development of, and general agreement on a proposed Curriculum Design for the FOODI MSc programme. This process (the Curriculum Development Process, referred to above) had begun on Monday when participants were asked to engage with the process and to think about what they thought the Vision and Values of FOODI should be, and what they would like the Programme Outcomes to encapsulate, embodied in FOODI Graduate attributes. There had been some engagement in this process prior to the study visit. Participants were allocated to each of five groups so that a balance was achieved between nationality, seniority and areas of expertise. Each group had access to an electronic device. Each group had access to a series of worksheets where they could outline the Vision and Values statements, the sub-components of which were (i) purpose, (ii) education and discipline values, (iii) nature of the learning environment for students and (iv) key approaches for teaching, learning and assessment. Also, a list of Programme Outcomes that they deemed important and relevant were agreed upon. These two key aspects of the Curriculum Development Process were each fed by wi-fi, from each group device, to a central laptop

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Deliverable 2.2 Study Visit to UCD, Dublin



device and could be projected onto the screen in the venue and visualised in real time. Thus, a series of Vision and Values statements were generated. Participants were asked to vote on each component of the Vision and Values statements and on this basis an amalgamated or aggregate Vision and Statement was generated. It read as follows:

Purpose: Be able to demonstrate advanced knowledge and skills in the interdisciplinary field of food science and technology with strong technical capability to contribute in the transformation of the food industry through creative, innovative and professional approach.

Education and Discipline Values: The programme will expose students to core and elective courses which will enable them to critically analyse, synthesize, evaluate, interpret and communicate aspects of the food business sector in a professional and ethical manner to foster creativity and innovation and thereby enhance development and resolve challenges.

The nature of the learning environment for students: The learning will be transnational, diverse, adaptive, innovative blended learning environment using a variety of methodologies and tools including traditional classroom lectures, laboratory work, field trips, case studies and simulations, team-based learning and project work, self-directed and autonomous learning, workshops, seminars, professional industry internships as well as webinars, on-line tutorials and include the auspices of FOODI Centres of Excellence for vocational training courses and digital learning (e.g. MOOCs).

The key approaches to teaching, learning and assessment: Academia-industry collaboration, diverse learning, critical thinking, projects, presentation, design thinking and prototype development, teamwork, collaboration, discourse and debate, group-based project learning, assignment, mentorship, case studies aligned to regional challenges but with a national and international context.

The associated Programme Outcomes agreed were as follows:

- Integrate knowledge of food science/technology/entrepreneurship principles for transformation of the food industry to produce quality, safe, sustainable, healthy food.
- Critically evaluate and apply innovative technologies for positive disruption and development of the food industry.
- Conduct research and adhere to legal, ethical and professional practices in food innovation.
- Demonstrate the ability to perform and effectively communicate original research in interdisciplinary areas of food science, technology and entrepreneurship.
- Implement standard analytical and innovative methods including digital technologies, statistical software to monitor the risks and hazards influencing food quality.
- Demonstrate responsibility in planning, resource management, supervision, problem solving and managing work within a team and collaboratively with other teams.
- Analyse the main economic and strategic issues concerning food markets and consumer preferences, creating effective marketing plans for the food industry
- Plan or lead an entrepreneurial venture/ "start-up" or apply intrapreneurial intervention in the food domain.

Target audiences for the uptake of FOODI MSc Programme and the desirable skills that they should possess were also agreed upon. A list of major and minor topics that should be included and how these should be sequenced and structured was decided on the penultimate day of the visit, with some discussion, iteration and refinement on the final day in advance of the FOODI Steering

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Committee meeting. It was decided by general agreement that the FOODI MSc Programme would contain 90 credits with a core allocation of 72 credits and an elective allocation of 18 credits, the latter to encompass the elements of the two streams envisaged for the FOODI Programme. Core courses included Research and Investigative Processes, Food Quality, Micro-and Macronutrient Analysis, Food Process Design, Processing Effects on Structural and Functional Components of Foods, Entrepreneurship and Business Strategy, Food Safety, Law and Regulation and Food Supply Chain, Traceability and Sustainability. A Project component of 30 credits was decided upon although significant discussion occurred at the practical aspects of how this would work. The Project component was subdivided into three areas – a course on Creativity, Design Thinking and Innovation, an Internship or Industry-based work project and a report, written in thesis format, but not formally recognised as a thesis. Significant discussion occurred about how this component would operate and how the sub components would be weighted and sequenced and further discussion was required after the study visit to arrive at tentative agreements. There were also a series of elective courses which included Food Packaging, Halal Regulation, Food Sales and Marketing, Nutrition and Health, Hot Topics/Global Issues and Consumer Behaviour. Students would need to complete 3 of the elective modules to complete 18 credits of electives courses. Crucially, since the target audience included up-skilling professionals and career changers, there was a conditional course in Introductory Food Science, bearing no credits.

No discussion or decision regarding the Vocational & Educational Training (VET) components were taken in Dublin but these were to be discussed in Salerno at the UNISA study visit.

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List of Participating Higher Education Institutions

IRELAND University College Dublin (UCD)

ITALY Università degli Studi di Salerno (UNISA)

GREECE Panepistimio Aigaiou - University of the Aegean (UAegean) Athens Metropolitan College (AMC)

MALAYSIA

Universiti Teknologi Malaysia (UTM) Universiti Teknologi MARA Sarawak (UiTM) Universiti Kuala Lumpur (UniKL) University of Malaya (UM)

CAMBODIA

University of Heng Samrin Thbongkhmum (UHST) University of Battambang (UBB) Svay Rieng University (SRU) Institute of Technology of Cambodia (ITC) Ministry of Education, Youth & Sport (MoEYS)

THAILAND Prince of Songkla University (PSU) Asian Institute of Technology (AIT)

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List of Study Visit Participants

Higher Education Institution	Participant Name	Participant Expertise
Universiti Teknologi Malaysia (UTM)	Prof Rosmini Omar	Leadership & Management Small & Medium Enterprise (SME) Development International Business
	Dr Nor Aiza Mohd Zamil	Financial Accounting Management Accounting Corporate Governance
	Prof Siti Zaleha Abdul Rasid	Financial Accounting Management Accounting Risk Management
	Dr Eraricar Salleh	Active Food Packaging Functional Food
	Prof Fauziah Sheikh Ahmad	Marketing Consumer Behaviour Branding SME Entrepreneurship
Universiti Teknologi MARA Sarawak (UiTM)	Prof Margaret Chan Kit Yok	Food Development & Processing (particularly upstream production)
	Prof Siew Eng Ling	Data Analysis
	Prof Mohammad Isa Mohamadin	Food Halal Analysis
Universiti Kuala Lumpur (UniKL)	Dr Noriza Ahmad	Food Safety QA & QC Halal Management Systems Protein Synthesis
	Mazidah Abd Rahman	Food Packaging & Food Safety Halal Management Systems
	Faridatul Ain Mohd Rosdan	Food Engineering Food Plant Design Powder Technology
University of Malaya (UM)	Prof Dr Ramesh T Subramaniam	Polymeric Materials (Carbohydrate, Proteins, Lipids) Polymer Chemistry Polymer Physics
	Assoc. Prof. Dr. Ramesh Kasi	Materials Science Biomaterials, Biopolymers Polymer Physics Polymer Characterisation
	Dr. Fatin Saiha Omar	Materials Science Polymer Physics Polymer Characterisation

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University of Heng Samrin Thbongkhmum	Vannaro Pin	Agricultural Science
(UHST)		Fruit Crop Production
		Forage Crop Production
		5 1
	Mr Pin Tara	Food Processing
		Food Development
	Mr An Theal	Agronomy Science
University of Battambang (UBB)	Dr Sam Rany	Laws & Regulations
		Educational Policies
		Internal Quality Assurance in Higher
		Education
	Koemseang Nhoung	Animal Science & Veterinary Medicine
	Mr Phyrum Vor	Human Resource Management
		Business Administration
		Business Automistration
Svay Rieng University (SRU)	IVIT LOEK VITAK	Business Administration
	Dr Serey Mardy	Agricultural Economics
		Agricultural Marketing
	Mr Khun Bottana	Chemistry
		Laboratory Managoment
Institute of Technology of Cambodia (ITC)	Dr Hasika Mith	Food Microbiology
		Food Processing & Preservation
		Food Product Development
		Food Safety & Quality
	Dr Poasmov Tan	Food Biotochnology
	Di Reasilley Tall	Food Biotechnology
		Food Processing
		Food Microbiology
		Food Safety
		Product Development
Ministry of Education, Youth & Sport (MoEYS)	Dr Nith Bunlay	Higher Education Capacity Building
	2	Qualification Framework
		University & Programme Licensing
Prince of Songkla University (PSU)	Prof Kongkarn Kijroongrojana	Product Development
		Sensory Evaluation
	Prof Muttita Meenune	Food Chemistry
		Flavour Chemistry & Technology
		Fruit & Vegetable Technology
		The a repetable rectinionagy
	D	
	Punnanee Sumpavapol	Food Safety
		Food Microbiology
Asian Institute of Technology (AIT)	Dr Anil Kumar Anal	Food Safety
		Food Microbiology
		Food Chemistry
		Food Diotochnology
		FOOU BIOLECHNOLOgy
	Dr Loc Thai Nguyen	Food Engineering
		Food Processing
		Biosensor & Chemical Sensors
		Waste Utilisation
	l	waste Utilisatiuli

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Panepistimio Aigaiou - University of the Aegean (UAegean)	Dr Ioannis Kinias	Business Management Entrepreneurship
Research Innovation and Development Lab	Mr Stefanos Veganas	Electrical & Computer Engineer
(ReadLab P.C.)	_	Artificial Intelligence
		Virtual Learning
Athens Metropolitan College (AMC)	Ms Eleni Damianou	Environmental Science
		Business Analysis
		Economics
		Sustainable Development
	Duff.	
Universita degli Studi di Salerno (UNISA)	Prof Francesco Marra	Computer Simulation of Food Processes
		Nicrowave Food Processing
		Radio-frequency food processing
		Heat & Mass Transfer
University College Dublin	Prof Frank Monahan	Food Chemistry
		Meat Science
		Food Analysis
	Dr Peter Dunne	Food Chemistry
		Meat Science
		Food Analysis
		Food Biotechnology
	Mrs Angela Brennan	Nutrition
	, j	Food Product Developmnt
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Deliverable 2.2 Study Visit to UCD, Dublin

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- Table 3. Matrix illustrating how study participants voted for each of the Vision and Values statement components/decision criteria. The decision criterion with the most votes is indicated in bold and encircled. This is also indicated in the rightmost column. Thus, these statements were included in the Vision and Values statement (see BOX ONE).
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- Figure 3. Initial Draft Course Descriptor template developed as an adjunct to the FOODI study visit to UCD. Note the essential information contained. The template also contains sub components, deliverables 2.4, 2.5 and 2.6.
- Figure 4. Food-related MSc Programmes in each designated area of Europe ((a) Area 1, 'Northern' Europe; (b) Area 2, 'Southern' Europe; (c) Area 3, 'Eastern' Europe, each indicated on map (d)). Approximate locations of the coordinating HEI in each case is also shown. UCD (Ireland) coordinated information gathering in Area 1, UNISA (Italy) in Area 2 and UAegean (Greece) in Area 3.
- Figure 5. Responses of European academics to FOODI survey questionnaire. Academics were asked about their views on whether there was substantial overlap between proposed FOODI content and their own programme, whether they emphasised technical or business content, the competitive advantage and unique selling point of their own programme and what the target audience for a FOODI MSc Programme should be.
- Figure 6. Asian FOODI Consortium partner countries in South East Asia (a) Thailand and Cambodia; (b) (d) Malaysia (showing Peninsular Malaysia and Malaysian Borneo)
- Figure 7. Study visit participants were asked on Monday to complete the above worksheets in preparation for the Wednesday morning session to consolidate both the Vision and Values Statement and the Programme Outcomes (for reference see the Curriculum Development Process in Figure 1, where the Vision & Values and Programme Outcomes are elaborated at the start of the Curriculum Development Process).
- Figure 8. (a) Programme Outcome template document that study visit participants were sent by email prior to the study visit to UCD. (b) From the responses to the email containing the Programme Outcomes draft template document, the programme Outcomes were compiled and collated, duplicates identified, and they were then merged into a list of the most common or 'core' desirable Programme Outcomes (on left) and secondary outcomes (on right) that are listed.

Figure 9. Group collaboration at the 'Learning by Doing' session at the UCD Innovation Academy.

Figure 10. Laboratory facilities in Science Centre South, Lab 2.56

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Figure 11. Major and minor topics to be included in course content of the FOODI MSc Programme.

- Figure 12. Curriculum structures proposed by each group: (a) Group 1; (b) Group 2; (c) Group 3; (d) Group 4; (e) Group 5.
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Study Visit Programme Summary and Schedule

All sessions will be held in room: FS1.08A in the Agriculture Building unless otherwise indicated.

AGENDA	
Monday 16 th Sept	ember 2019
09.00 - 09.20	Welcome to UCD
	Introduction to UCD and aims of the study visit week.
	By Prof Frank Monahan
09.20 - 09.40	Introductions
09.40 - 10.00	The Curriculum Design Process (CDP)
	Overview of the CDP stages that will be covered during the study visit.
	By Prof Frank Monahan
10.00 - 11.00	Summary of the Work Package 1 groundwork
	4 x 10 minute presentations:
	'Identification of similar curricula in Europe'
	By Dr Ioannis Kinias, UAegean
	'Identification of similar curricula in Asia and Industry focus groups'
	By Prof Margaret Chan Kit Yok, UiTM
	 'Identification of existing Professional Training courses, Skills needs analysis and Internship demand'
	By Ms Eleni Damianou, AMC
	Interpretation of the WP 1 key findings followed by group discussion
	By Dr Ioannis Kinias, UAegean
	Objective: As everyone will have had the opportunity to read the WP1 report prior to the visit, this will be a high level summary of the main findings from each component part of the WP1 groundwork followed by an interpretation as to how these findings might feed into the proposed FOODI MSc programme.

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	By the end of this session, we will have the information required for the subsequent discussions of the various stages of the CDP.
11.00 - 11.20	Coffee/tea break
11.20 - 13.00	'Vision, Values & Country Context'
	3 x 10 minute presentations by the Principal Project partners:
	 Malaysia: Prof Margaret Chan Kit Yok, UiTM
	 Thailand: Dr Anil Kumar Anil, AIT
	Cambodia: Dr Rany Sam, UBB
	Objective: The curriculum is highly influenced by the social, physical, economic and
	cultural environments. The presentations will share the contextual influences of the
	respective countries in the agriculture and food industry landscape that will determine
	of the need's assessment from WP1 to inform a vision & values statement.
	By the end of this session. a vision & values statement for the FOODI MSc
	programme and who the target audience is will be created (stage 1 of the CDP) and can
	be revisited throughout the course of the week as necessary.
13.00 - 14.15	Lunch in main restaurant, Gerard Manley Hopkins Building.
14.15 - 15.30	'Collaboration is key'
	By Prof Dolores O'Riordan, Director of UCD Institute Of Food & Health and UCD member of 'Asia Matters'
	'Experience of an internship including the benefits and limitations'
	By current students Róisín O' Sullivan and Michelle Kearns with Glanbia Nutrition Group and The Department of Agriculture, Food and the Marine.
	Location: Global Lounge, Gerard Manley Hopkins Building
	Objective: The UCD Institute of Food and Health has strong links with industry, enterprise and government agencies. Central to the Institute's philosophy is the translation of its research for commercial, economic and societal impact.
	By the end of this session, the benefits of involving potential employers in the delivery of learning, collaboration on research/projects, sharing equipment and developing career opportunities will be demonstrated and also how new product innovations can emerge.
15.45 - 16.20	Coffee/tea break (return to FS1.08A)

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16.20 - 17.00	Laboratory tour, O'Brien Science Centre South (optional)
	By Dr Sabina Harrison, Soniar Tachnical Officer
	by Dr Sabine Harrison, Senior rechnical Officer

Tuesday 17 th September 2019	
09.00 -13.00	'Creativity & the ability to innovate – learn by doing'
(20 min coffee/tea break approx 11.00)	Innovation Academy Workshop introduced by Dr Colman Farrell, Head of Programme Development and facilitated by Entrepreneurial Specialists Kathleen Lonergan Erickson and Jacinta Owens.
	Location: Shackleton Lounge, O'Brien Centre South
	Objective: Innovation has been highlighted as an essential element of the proposed FOODI MSc programme. This workshop aims to demonstrate the importance of a 'hands- on' learning approach and introduces example strategies for innovation. In addition, a brief overview of the successful collaborations to date by the Innovation Academy in Asia will be shared.
	By the end of this workshop, the importance of 'experiential learning' as the most effective approach to creating an innovative mindset will be demonstrated and strategies as to how this might be incorporated within the FOODI MSc programme discussed.
13.00 - 14.30	Lunch in main restaurant, Gerard Manley Hopkins Building.
14.30 - 15.30	'A Tale of two Masters'
	By Dr Aideen McKevitt, Programme Director MSc Food Nutrition and Health
	Objective: This interactive session will give an overview of how two of UCD's online MSc programmes (MSc Food Regulatory Affairs and MSc Food, Nutrition & Health) have evolved since their original conception to present.
	By the end of this session, there will be a demonstration & discussion of what elements contribute to the successful design and delivery of a programme and their potential relevance within the proposed FOODI MSc programme.
15.30 - 16.00	Using the 'Flipped Classroom' approach for Blended Learning - the pros and cons
	By Dr. Amalia Scannell
16.00 - 16.20	Coffee/tea break

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16.20 - 17.00	Laboratory tour, Agricultural building (optional)
	By Dr Vincenzo del Grippo, Food & Nutrition Technologist and Dr Tesfaye Bedane, Research Fellow
17.15 - 20.00	FOODI Group Welcome Meal in the University Club and Group Photo

Wednesday 18 th September 2019							
09.00 - 13.00	'Consolidation of the FOODI MSc Programme Outcomes'						
(20 min coffee/tea break	Workshop facilitated by Prof Frank Monahan & Dr. Aideen McKevitt						
at 11.00)	Objective: The development of programme outcomes is critical to assist in the decisions around curriculum design and also to communicate to students & other stakeholders the purpose and focus of the FOODI MSc programme. Each HEI will have submitted their desired programme outcomes prior to the visit and these will be shared & discussed.						
	By the end of this workshop, a set of core outcomes will be agreed, with potentially a few further outcomes tailored to the individual HEI's (stage 2 of the CDP).						
13.00 - 14.30	Lunch break - Walk around campus with picnic bag.						
14.30 - 17.00	'Mapping potential Teaching, Learning and Assessment/Feedback methods'						
(20 min	By UCD academics:						
at approx.	Dr Sharleen O'Reilly, Dr Celine Murrin, Dr Breige McNulty and Prof Jim Lyng						
16.00)	Objective: The purpose of curriculum mapping is to ensure that the teaching and learning activities, assessments, and/or content of a programme align with the programme outcomes. Case studies will demonstrate successful potential teaching, learning & assessment/feedback approaches used within both the current MSc Food, Health & Nutrition plus other food related programmes offered in UCD.						
	By the end of this session, some potential teaching, learning and assessment/feedback methods will be identified and debated as to their relevance within the context of the proposed FOODI MSc programme (stage 3 of the CDP).						
Thursday 19 th	Thursday 19 th September 2019						
09.00 - 10.30	'Essential transferable skills toolkit for Masters students'						
	By Julie Dowsett, Postgraduate Programme Manager and Executive Education						
	Objective: This session will demonstrate the importance of equipping students with						



	the key transferable skills that industry look for in employees, and will highlight some					
	examples of how this can be achieved.					
	By the end of this session, it will be possible to assess how such skills might be					
	incorporated within the FOODI MSc programme through appropriate teaching,					
	learning and assessment methods.					
10.20 12.00	(Curriculum Structure and Cale and Learning Annual sheet)					
10.30 -13.00	Curriculum Structure and Conerent Learning Approaches					
(20 min	Facilitated by Dr Geraldine O'Neill					
working						
coffee/tea break	Objective: This workshop will focus on stage 5: The practicality of planning the FOODI					
approx 11.00)	MSc programme's structure and learning approaches.					
	By the end of this workshop, using the agreed outcomes from the earlier session, a					
	coherent and systematic approach to the teaching/learning and assessment strategies					
	will be discussed.					
13.00 - 14.30	Lunch in main restaurant, Gerard Manley Hopkins Building.					
14.30 - 16.00	'Aligning Programme Outcomes to potential Assessment and Feedback strategies'					
	Facilitated by Dr Geraldine O'Neill					
	,					
	<i>Objectives: This workshop will focus on stages 3 and 4 of the CDP.</i>					
	By the end of this session, we should be able to					
	a) Develop some potential assessments, that align with the revised					
	b) Map these to the programme outcomes					
	c) Plan some key feedback strategies to use across the programme(s)					
16.00 - 16.20	Coffee/tea break					
16.20 - 17.00	Summary of work completed to date					
Friday 20 th Se	ptember 2019					
00.00 12.00	Dren good list of tonics (courses					
09.00 - 12.00	Proposed list of topics/courses					
(working	Objective: To create a potential list of recommended topics/course titles. These will					
coffee break at	then be distributed between the partners and they will be requested to write the					
11am)	proposed outcomes & assessment methods & recommended teaching & learning					
	approacnes.					
	By the end of this workshop, a list of desired topics/courses will be created and					
	over the next 5 weeks, the outcomes for each will be proposed and the appropriate					
	teaching, learning & assessment approaches be recommended. The latter will have to					

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	be decided according to <u>local</u> context. Circulate them online for comments prior to consolidation in Italy.
12.00 - 13.30	 Steering Committee Meeting: Discussion regarding equipment Financial & Reporting update Q&A on any WP areas of project that require clarification Study report
13.30	End of visit. Lunch will be available in the main restaurant.

NOTE: Structure of the Report.

This report has been written according to the sequence of events that occurred during the study visit whereby detail is elaborated on a day-by-day basis, starting on Monday, September 16th and culminating in study visit outcomes on Friday, September 20th.

Throughout the report selected slides have been integrated to elaborate specific aspects of what was presented.

Development of the proposed FOODI Curriculum structure followed a systematic but iterative process and the contributions of delegate groups to final proposed outcomes is articulated in Tables and Figures.

Specific study visit outcomes are provided in a series of five boxes.

All materials relevant to the study visit including presentations have been uploaded to the FOODI Project intranet <u>HERE</u> (click and follow link).

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Study Venue – FS1.08A, Food Science Annex (indicated immediately below)



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Key Objectives

- To demonstrate some of the approaches used by University College Dublin in both inculcating and fostering an innovative mindset and in developing a new Curriculum or Programme at Master's Degree Level and
- To demonstrate elements of relevant UCD Programmes, in particular the online MSc in Food, Nutrition and Health and to discuss their transferability to the proposed FOODI Programme
- To engage in discussion to elaborate the needs of FOODI Consortium partners to meet the objectives of the overall project
- To design a Curriculum that met the needs of the Asian HEI FOODI Consortium partners

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Study Visit Day One

Monday, September 16, 2019

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Study Visit Day One

Monday, September 16, 2019. Time: 09.00-13.00

Activity: Overview of The Curriculum Design Process

Objective: to introduce study visit participants to University College Dublin (UCD) and outline the schedule for the study visit, explaining the rationale for the schedule, based around the Curriculum Design Process.

Outline and Key Findings: The Curriculum Design Process provided the rationale and framework for the study visit since the overall objective of the study visit was to 1) demonstrate elements of relevant UCD Programmes, in particular the online MSc in Food, Nutrition and Health and to discuss their transferability to the proposed FOODI Programme, and 2) to work with the FOODI Partner HEIs on the proposed Programme Curriculum Design to ensure it was appropriate to their needs, based on their country and institutional context. The purpose of the introductory session was also to elaborate the rigour and process that constitute best practice when designed a new curriculum at Masters Programme level. Given that the Curriculum Design Process was central to the study week, and given that the ethos underlying FOODI was inculcation of an innovative mindset, UCD teaching and learning and UCD Innovation Academy were also involved. This session was delivered by Professor Frank Monahan who outlined the Curriculum Development Process by reference to the Curriculum Development Wheel (Fig.1) used by Professor Geraldine O'Neill of UCD Teaching and Learning and drawing on best practice in coherent and integrated course design outlined by Fink (2003) (Fig 2).



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Figure 1. Curriculum Design Process used by UCD Teaching and Learning.

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Figure 2. Key components of integrated course design (Fink, 2003). Situational factors, as country contexts, were outlined in the late morning session by presenters from each of Malaysia, Cambodia and Thailand.

Briefly, the Curriculum Design Process must begin with a high level elaboration of the vision and values that will be espoused by the Programme of study. Only when the vision and values have been considered and developed should the Programme Outcomes (sometimes referred to interchangeably as Graduate Attributes) be developed. Steps 3 to 5 of the Curriculum Design Wheel (Fig.1, above) must also be aligned to each other (see Fig. 2) so that both teaching and learning activities and assessment and feedback map to the course learning goals and they each map to each other also to ensure coherence. Coherence in curriculum design connotes scope, sequence, integration, articulation and balance in relation to what modules are chosen, taught and how and when they are taught (see Thursday). For example, if one of the learning outcomes is to cultivate critical thinking in students, then the teaching and learning activities must align with this by using methodologies to develop critical thinking, but the assessment and feedback must also determine whether students have learned to think critically. The final step in the Curriculum Design Process was to develop Course Descriptors (or Module Descriptors; both 'course' and 'module' are used interchangeably when discussing curriculum structure, but it was decided to adhere to common terminology in FOODI, and use 'Course'). Course Descriptors typically contain key information that is needed for Course lecturers and students (Fig. 3, below).

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	T						
Programme Title	FOODI MSc in Food Processing and Innovation				F	or D2.4 Description	of methodology and
Specialization	Food Processing & Health The Business of Food Processing				Alignment of Learning Outcomes, Teaching & Learning Activities and Feedback & Assessment		
Module Title:					Learning Outcome	Teaching & Learning Activity	Feedback & Assessment
Module Code:							
Module Type:	Core Elective					-	
Module Coordinator							
Credits:	ECTS	Level:	9	Semester:		A.	
Module Places					Resources		
Module Description					Recommended Textbook Resou	rces	
					Supplementary Textbook Resor	irces	
	a 1.0				supprementary recebbox nesse		
Learning Outcomes. 1	On completion	the candidate will b	e able to:				
2					Recommended Academic Journ	als and Peer-reviewed Articles	
					Other Literature Resources		
		- Br	e hours		1000		
Indicative Student W	/orkload:	Indicativ					
Indicative Student W Class Contact: Lectur	/orkload: res	Indicativ			Online and web-based Resource	5	
Indicative Student W Class Contact: Lectur Class Contact: Small	/orkload: res Group Discussic	Indicativ			Online and web-based Resource	25	
Indicative Student W Class Contact: Lectur Class Contact: Small online Class Contact: Practi	/orkload: res Group Discussio cal Workshops	Indicativ			Online and web-based Resource	rces	
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Indicative Student W Class Contact: Lectur Class Contact: Small online Class Contact: Practi Specified learning act Blended learning act Autonomous studen	forkload: res Group Discussio cal Workshops tivities ivities t learning	Indicative			Online and web-based Resource	res	
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Indicative Student W Class Contact: Lectur Class Contact: Small online Class Contact: Practi Specified learning act Bended learning act Autonomous studen Total hours Assessment Strategi	forkload: res Group Discussio cal Workshops tivities ivities t learning	Indicative			Online and web-based Resource Material and equipment Resou Additional information	es	

Figure 3. Initial Draft Course Descriptor template developed as an adjunct to the FOODI study visit to UCD. Note the essential information contained. The template also contains sub components, deliverables 2.4, 2.5 and 2.6.

Activity: Summary of Work Package 1 groundwork

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Objective: As everyone will have had the opportunity to read the WP1 report prior to the visit, this will be a high level summary of the main findings from each component part of the WP1 groundwork followed by an interpretation as to how these findings might feed into the proposed FOODI MSc programme.

Outline and Key Findings: This session was delivered by Ioannis Kinias and Eleni Damianou. Dr. Kinias summarised the finding of WP1 to discover similar curricula in Asia and Europe. He also elaborated the findings of a survey of academics in relation to their views on specific issues relating to the FOODI Programme. Since VET courses are also a component of the FOODI Project, Eleni Damianou also outlined key findings in relation to this aspect also.

Generally, the MSc. Coursework in Asian programmes required completion of 34 Asian credits of core courses and 6 credits of elective courses with presentation and submission of dissertation in all HEIs from Malaysia, while the only programme in Cambodia from Institute of Technology of Cambodia requires 52 total credits. MSc Coursework programme in Thailand requires 39-48 total credits. Method of teaching includes lectures, laboratory practical, assignment, case study and mini project. In total, there were 790 MSc courses of which 67% were categorised as Science & Technology courses. (Note: at the outset, it had been agreed that 'course', as defined and understood in the context of FOODI was

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equivalent to what would be referred to locally in UCD as a 'module'. This was a crucial step as there had been some confusion regarding the meaning of 'course', where it could be understood by some to refer to an entire MSc Programme.)

In total, 23 VET Courses were identified in Asia but the contexts were very different in each of the countries. Cambodia is largely still an agricultural economy and a focus on agro-industries was seen as key. Knowledge gaps in product quality, quality management systems and product development were evident. Food packaging and labelling, food innovation and food value chain were seen as critical and there was a need for an integrated curriculum on food technology, entrepreneurship and agro-business.

In Malaysia, there was a lack of short course for professional development and most courses were not seen as being designed to local needs. There was also a gap in Halal regulations and certification. Soft, or transferable skills, such as communication, leadership, teamwork and motivation were also viewed as lacking.

In Thailand, there is a lack of courses relating to food innovation, sustainability, product quality and product development.

In the 36 Master programmes in Asia, more than 65% of the offered courses focus on Science and Technology dimension and more specifically in sub-dimensions such as Food Science and Technology, Food Chemistry, Functional Food, Food Development, Food Nutrition, Food Processing and Food Safety and Quality. On the other hand, the dimension of Entrepreneurship & Innovation is in less than 10% of the offered courses.

The aim of the European component was to study similar programmes and curricula in Europe in order to identify the gaps and better assess the exact academic needs that must be catered for by FOODI. The research was planned into two phases: a) Research for similar postgraduate courses at universities in Europe and b) Qualitative research through questionnaires to academic experts in food science. A total of 134 MSc courses were discovered in Europe, with 60 in Area 1, 39 in Area 2 and 35 in Area 3 (Figure 4). Only 15-20% of the MSc courses identified had a more entrepreneurial perspective and a lack of entrepreneurship and innovation was evident from studying the curricula. In general, MSc courses had less entrepreneurship, less innovation, less engineering and less training with respect to what is anticipated on the FOODI MSc Programme. All MSc Programmes were either of 3 or 4 semesters duration and were ranged from 90 to 120 ECTS. A Thesis component of 30 ECTS was almost a standard requirement.

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Figure 4. Food-related MSc Programmes in each designated area of Europe ((a) Area 1, 'Northern' Europe; (b) Area 2, 'Southern' Europe; (c) Area 3, 'Eastern' Europe, each indicated on map (d)). Approximate locations of the coordinating HEI in each case is also shown. UCD (Ireland) coordinated information gathering in Area 1, UNISA (Italy) in Area 2 and UAegean (Greece) in Area 3.

The qualitative research process created lists of qualified academics who could participate in this qualitative research and with their opinion contribute to the creation of FOODI Master Course. From this sample, researchers received finally answers from 75 Academic Experts in Food Science and Food Technology from throughout Europe.

The key issues that this qualitative research tried to investigate was:

- The importance of specific modules in Business / Innovation / Entrepreneurship area.
- The importance of specific modules in Food Science / Food Technology / Food Engineering area.
- Technical modules should form the major part of postgraduate programs for the Food Industry?
- Business perspective is needed in postgraduate programs for the Food Industry.
- What is the competitive advantage/unique selling point of your own program?
- What is the target group for your own MSc program?

Respondent were asked to rank the importance of the statement from 1 (not important) to 5 (very important). Responses to the series of questions are outlined below.



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<u>competitive advantage/unique selling point of your own program?</u>



competitive advantage/unique selling point of your own program?



target group for your own MSc program?



Figure 5. Responses of European academics to FOODI survey questionnaire. Academics were asked about their views on whether there was substantial overlap between proposed FOODI content and

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their own programme, whether they emphasised technical or business content, the competitive advantage and unique selling point of their own programme and what the target audience for a FOODI MSc Programme should be.

The questionnaire feedback provided some very clear messages of critical importance to informing the FOODI Curriculum Design Process. Among the key messages were:

- Importance of the main subject of food science and food technology is highlighted by the academic experts.
- European academics consider as strengths the fields of food processing, food quality and food & health. As their lesser strength, they consider the dimensions of engineering and entrepreneurship such as Food Packaging and Labelling, Logistics and Transportation and Entrepreneurship in the Food Industry as of lesser importance.
- Experts agree that the main body of such a postgraduate program should be technical courses in the field of food science.
- There is a requirement for management courses to deal with supply chain management and agri-food marketing.
- Academics also consider that the main target audience for a food-related MSc should be agriculture and food graduates, engineers and food business employees.
- Distance learning was not regarded as a priority.

Eleni Damianou briefed the participants on the outcomes of the focus groups which were conducted in Asia. In the field of professional training courses in food innovation, over 20 courses were identified (4 in Malaysia, 10 in Cambodia and 7 in Thailand). The most urgent gap was the need for VET courses in the food sector to include a focus on soft skills and digital skills. The VETS courses identified were as follows:

Malaysia: 4 identified training programs

- Food Processing
- Food Safety management system
- Food Safety, Hygiene & Microbe Training
- Food analysis and Nutrition Labelling for the industry

All were delivered face-to-face. Lasted 2-3 days

They had targeted learning outcomes and were delivered by VET centres.

Cambodia: 10 identified training programs

- Food-Fortification Partnership Dialogue Towards Operational Engagement
- Piloting the Post-harvesting Technology and Skill Bridging Program for Rural Poor
- Formation of Cambodian Association of Food Science and Technology (CAFST)
- Safe Food Courses
- Personal Hygiene and Food Safety

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- Safety, good practice, farm management, and cost-return analysis for live-stock, aquatic animal, and crop
- Bachelor's degree in Food Science, Post-Harvest Technology, and Food Biotechnology
- Piloting the Post-harvesting Technology and Skill Bridging Program for Rural Poor
- Food Quality Management System: HACCP Implementation
- "Training Course on Post-Harvest Technology and Management for Reducing the Losses of Agricultural Commodities for Cambodia, Laos, Myanmar, and Vietnam"

Thailand: 7 identified training programs

- Short term training course (STTC- 2018) on "Safety and Quality in Innovative Food Production System"
- Short- course training are offered in the areas of applied food science, food safety and toxicology, and applied biostatistics.
- Train the Trainer: Food Safety Management (for CLMV)
- Food Security Postharvest, Processing and Quality Assurance of Selected Agro-Industrial Products
- Toward a One Health Approach to Antimicrobial Resistance
- Sustainable Animal Production and resource Management for Sustainable Agriculture and Food Safety
- R&D in Postharvest and Processing Technology for Food Security

Focus Groups Findings

Malaysia: key findings related to the fundamental challenges faced by the food industry. Problemsolving, teamwork, negotiation, innovation and digital skills were identified as the main gap areas that any proposed VET should focus on.

- Curricula needed were identified as follows:
- Curricula needed:
- Halal Certification
- Regulatory Requirements
- Food Safety
- Licensing dietician
- Financial aspects of business
- Food Chemistry
- Food Engineering
- Food Marketing
- Food waste management/reengineering
- Skills for developing "Wholesome Nutritious Food"
- Negotiation Skills

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Cambodia:

Key Findings:

- Need for Quality assurance
- Need for new creative ideas
- Communication skills.
- Product development can be an input in the food processing.
- Digital Skills

Curricula design must include the followings:

- Entrepreneurship and innovation
- Food supply chain management
- Food legislation and international trade
- Consumer preference and behaviour
- Innovative food products
- Innovation in industrial food processing
- Food safety and quality management
- Advanced food analysis
- Unit operation and food engineering
- Industrial process control
- Research methodology in food science
- Entrepreneurship and innovation

Thailand:

Key Findings:

- Demand for training courses in the areas related to food innovation.
- Training courses have to focus on the development of academic, technical and soft skills. The enhancement of specific skills such as laboratory analysis, management, communication and software skills.
- Lack of laboratory skills and quality analysis management.

The European Qualifications Framework was also outlined as it was considered important and relevant in regard to the cross-jurisdictional and international nature of the proposed FOODI MSc Programme.

Agreed Actions and Outcomes: At the end of the session it was agreed that as part of the needs assessment and, in fact, the country context, that the National Qualification Framework for each partner Asian country should be outlined.

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Activity: Vision, values and Country Context.

One presenter from each country (Malaysia, Cambodia, Thailand, see image at right)) gave a synopsis of the current agriculture and food production context in their country. Consideration of context is a key element of Curriculum Design and speaks to the situational factors referred to by Fink (2003). Country presenters were asked to frame their presentations around the following questions.

1. What are the main geographic and economic statistics that relate to agriculture and food production?

2. What are the main agricultural products destined for processing?

3. What is the nature of the food processing industrial base in each country?

4. Is the food sector geared towards export or domestic consumption; what is the balance?

5. Regarding cultural/institutional aspects and gastronomy, what are the favourite or traditional foods? Is there formal data available? Are there representative national dishes? How are meals typically eaten?

6. Regarding institutional aspects, are there specific regulations, law or policy regarding food processing, food innovation, traceability etc.?

7. What is the purpose of the proposed MSc programme?

8. Who is the FOODI MSc programme aimed at (e.g. recent graduates, healthcare professionals, industry professionals etc.)?



Figure 6. Asian FOODI Consortium partner countries in South East Asia – (a) Thailand and Cambodia; (b) – (d) Malaysia (showing Peninsular Malaysia and Malaysian Borneo)







The country context (or situational factors, referred to by Finks (2003)) for each Asian partner country is presented in a series of three boxes. Dr. Margaret Chan Kit Yok presented the country context for Malaysia; Dr. Sam Rany presented the country context for Cambodia; Dr. Anil Kumar Anal presented the country context for Thailand.

(d)

BOX 1. COUNTRY CONTEXT - MALAYSIA

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3. What is the nature of the food processing industrial base in each country?

Livestock and Dairy: Poultry processing constitutes 60% of the meat processing industry. Although Malaysia is a net exporter of poultry meat, it is still a net importer of meat products, particularly beef and mutton. Poultry meat is a major raw material for further processing.

Among dairy products produced are milk powder, sweetened condensed milk, pasteurised or sterilised liquid milk, ice cream, yoghurt and other fermented milk. Except for the production of pasteurized milk, the dairy product industry is dependent on imports. Fisheries: The fisheries sector produced about 2 million tonnes of fish in 2017 of which aquaculture sector contributed more than 400,000 tonnes.

An export-oriented sector, seafood processing includes the processing of prawns, frozen products, canning of fish and the production of surimi and surimi products. Malaysia's total exports of seafood including fresh, chilled / frozen seafood and other seafood processed products exceeded RM2.9 billion in 2017.

Cereal Products / Flour Based Products: The cereal products sub-sector, including the production of biscuits, bakery items and noodles, is well established in Malaysia. Although this sub-sector is dependent on imported raw materials, Malaysia is a net exporter of cereal preparations / products, with a net export of more than RM3.5 billion in 2017. The range of products includes pre-mixes, bread, biscuits, snack foods, instant noodles, vegetarian food, frozen cakes and pastries. Chocolate and Sugar Confectionar Malaysia is the eighth largest cocoa process country in the world. Malaysia is a net expc of cocoa products including chocola exporting to more than 90 countries. Export cocoa preparations were valued at RM4.2 bi in 2017.

Malaysia's cocoa grinding capacity recor 218,258 tonnes in 2017, provides raw mate for further downstream processing.

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3. What is the nature of	the food processing	
industrial base in	each country?	
Pepper and pepper products: Malaysia's export of pepper and pepper products amounted to RM308.9 million in 2017. Value-added pepper and pepper products include specialty bepper and processed pepper-based products such as spice mixes and blends, seasonings and flavourings. Fruits and Vegetables: A variety of fruits and vegetables are produced for fresh consumption in domestic and export markets as well as for downstream processing. Major activity in the downstream processing of fruits is the canning of pineapple and pineapple juice. Other fruits such as guava, peasion fruit, jackfruit and banana are also being processed into puree/juice, snacks, pickles and jam. Processing of vegetables is confined to the production of sauces and pickles. Malaysia's import of processed fruits and vegetables is valued at RM1.9 billion in 2017, while exports recorded at RM1.2 billion. The fruit and vegetable processing industry has tremendous potential for import substitution and export opportunities, investors are encouraged to undertake the commercial cultivation of fruits and vegetables.	Paim Oil-based Products: Malaysia is the second world's largest exporter and producer of palm oil. Malaysia and indonesia account for more than 84 per cent of the world palm oil output and about 89 per cent of global exports of palm oil. Export earnings from oil palm products reached RM74.7 billion in 2017. Major markets for oil palm products are India, Europe, the People's Republic of China, Pakistan and Philippines. Main products exported are RBD palm oil, RBD palm olein and stearin, specialty fats such as cocoa butter substitutes, margarine, shortening and vanaspati. Further development is seen in the production of value-added palm oil-based specialty products to cater to health conscious and vegetarian consumers.	
Three thrust areas:		
1.Health Food/Functional Food 2 Convenience Food		
3.Food Ingredients		
Malaysia's current population of 32 million with pur RM39,656 or US\$8,906 in 2017. Lifestyle changes ha and health foods. (Malaysian Investment Development Authority, 201	chasing power (per capita income exceeded ive led to an increase in the demand for conv 8)	enie
A the block from attended from d		
•Organic farming focusing on organic products, heal	th foods including low caloric, fibre / nutrient	t
enriched products, fruit juices and herbal products •New products using Malaysia's traditional herbs ar 2. Convenience Food	ç	

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developing and improving its agriculture and food processing industry to become a net exporter of processed food Processed food accounts for about 10% of Malaysia's manufacturing output . Export value - RM21.1 billion (> 200 countries) Import value - RM20.7 billion 5. Regarding cultural/institutional aspects and gastronomy, what are the favourite or traditional foods? Is there formal data available? Are there representative national dishes? How are meals typically eaten? Malaysian culture has grown from a potpourri of ethnic mixes derived from some of the world's oldest civilizations. Co-funded by the Favourite or traditional foods Erasmus+ Programme foodi f the European Union Top 3 traditional food Category (%) ERASMUS+ СВНЕ 21.6 **Rice Based** Nasi Lemak 9.8 Nasi Kerabu 9.0 Nasi Dagang Noodles Laksa 35.1 Mee Kari 29.1 Mee Mamak 9.9 Gravies & Rendang 41.3 Accompaniments Dishes Masak Asam Pedas 10.8 Budu 9.6 Kerabu Mangga Muda 27.7 Appetiser Sambal Belacan 23.2 12.5 Cencaluk Cake, Porridges 10.5 Bubur cha cha & Dessert Bubur kacang hijau 93 Pengat 4.3 Kuih seri muka 8.1 Kuih koci 4.7 Md Ramli, A., et.al., / Asian Jour Kuih keria 2.6 Quality of Life, AjQoL, 2(5), Jan. 2017 (p.31-42) Karipap 5.5 4.7 Agar-agar Bahulu 4.7 Drinks Teh tarik 354 Cendol 27.5 ABC 20.2

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Roti canai - Indian influences and a type of flatbread that has savoury and sweet variations usually eaten with dhal (lentil curry) or other type of curries but sometimes depending on the person's taste it can be dipped in condensed mild or sugar



Char Kuey Teow - one of Southeast Asia's most popular noodle dishes, flat rice noodles cooked with dark and light soy sauce, chili, de-shelled cockles, any type of vegetables and sometime mixed in with eggs or prawns









Murtabak - a type of stuffed pancake that originates from Saudi Arabia and India meaning 'folded' in Arabic stuffed with minced meat/chicken/mutton companied with onions, eggs and garlics served with light curry

Rojak - a mixture or a blend which is a spicy salad consisting of mixed tropical fruits and vegetables with typical ingredients of cucumbers, jicma, pineapple, rose apple, bean curds, apple, mango and with other variations including cuttlefish, fried tofu, cruller and crispy fritters.

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of basically yellow noodles with beef/chicken/shrimp cooked with soy sauce, veggies and eggs with a bit of chilli tossed in for an irresistible jolt



Bak Kut Teh - name literally translates as "meat bone tea" consists of fatty pork ribs simmered in a broth of herbs and spices (including star anise, cinnamon, cloves, dong guai, fennel seeds and garlic) with additional ingredients including offal, varieties of mushroom, choy sum (vegetables), and pieces tofu puffs



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Nasi Kandar - popular northern Malaysian food, which originates from Penang, a meal of steamed rice which can be plain or mildly flavored, and served with a variety of curries and side dishes such as fried chicken, gizzards, curried mutton, cubed beef, fish roe, fried prawns or fried squid and vegetable dish would usually be brinjal (aubergine), okra/bendi (lady fingers) or bitter gourd.

6. Regarding institutional aspects, are there specific regulations, law or policy regarding food processing, food innovation, traceability etc.?

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100% income tax exemption on capital expenditure for 10 years or income tax exemption on export sales for 5 years for productions of Halal Specialty Processed Food, Pharmaceuticals, Nutraceuticals & Probiotics, Cosmetics and Personal Care products, Halal Ingredients and Livestock and Meat products



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BOX 2. COUNTRY CONTEXT - CAMBODIA

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- Gross national income: 60.12 billion PPP dollars (2017) World Bank
- GNI per capita: 3,760 PPP dollars (2017) World Bank (note different source from above).
- Cambodia's agricultural exports are raw products (cashew nuts, mangoes, rubber, and cassava), headed to Thailand and Vietnam, where they are processed.
- The Cambodian government set a goal of exporting one million tons of milled rice by 2015, but actual exports totalled only 538,396 tons. In 2017, 635,679 tons of rice and in 2018, 626,225 tons of milled rice was exported.
- Cambodia also lacks a developed food processing industry only 10% of Cambodia's agricultural goods are processed.
- In 2017, the sectoral share of agriculture was as follows: crops (13%), livestock & poultry (2.6%), fisheries (5.5%) and forestry and logging (1.6%). Crops and fisheries are the leading sub-sectors in the agricultural economy.
- In 2018, total horticulture production (corn, sweet potato, all kind of vegetable, chilli, water melon) area was achieved 85,345 ha, it is increased 2.82% compared to 2017 which was 83 002 ha. The production was 797,559 tons
- Short-term industrial crops production (Red corn, cassava, mung bean, ground bean, soy bean, sesame, sugar cane, jute, tobacco, lotus) area was achieved 1,006,542 ha, it is increased 3.47% compared to 2017 which was only 727,740 ha. The production was 15,847,801 tons and it was increased 0.295 compared to 2017.

2. What are the main agricultural products destined for processing?

Agricultural sector is one of key priority sectors of the Royal Government of Cambodia (RGC). Currently, Rice production, farmers have been changing their production habits from consumption to trade due to the high market demands.

Relevant stakeholders including public sector, private sector, and NGOs have been providing services to increase knowledge and know-how to the local farmers.

Private sector has directed towards export-oriented production through increased processing capacity with quality and quantity to meet the international market demands especially export of yellow bananas, mango (Keo Romeat), pepper, cassava, and other key agricultural products.

The rubber export in 2018 achieved 217,500 tons accounted for USD 287 million compared with 188,832 tons in 2017 and accounted for USD 299 million, the export of rubber production increased to 28,668 tons, equivalent to 15.18%. But the rubber revenue decreased about USD 12 million, equivalent to 4.16%. The average exported rubber prices of 2018 accounted for USD 1,319/ton compared with USD 1,585/ton in 2017, decreased USD 267/ton, and equivalent to 16.83%.

3. What is the nature of the food processing industrial base?

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Deliverable 2.2 Study Visit to UCD, Dublin The Cambodian industry remains weak as reflected by its simple structure, narrow base and low level of sophistication, while mostly concentrated in garment and food processing industries. Key features of Cambodian industries consist of: a lack of diversity in industrial base an informal and missing middle structure a weak entrepreneurship an urban-centred industry a low value addition low level of technology supplication. The majority of domestic enterprises focuses only on food processing and semi-finished products with generally low level of technology usage Overall, most of Cambodia's enterprises are in retail and food establishments. Of some 510,000 enterprises, 14% are in manufacturing, 45% are in food and beverage processing, 35% are garment and textile enterprises. Expansion & Modernisation of Small & Medium Enterprises Explore possibilities of establishing agro-processing zones such as furniture manufacturing, rubber processing, seafood processing, food processing for domestic use and export through public-private partnership - Provide incentives to companies to locate in these areas; - Create a development and promotion fund for export led product development using agro-processing technology; - Develop a coordination mechanism for processed agricultural product exports by way of addressing logistic issues, abolishing informal fees and improving trade facilitation; - Conduct a study to identify priority products with potentials to be processed for export and prepare a comprehensive action plan based on value chain in order to enable the Royal Government to provide concrete support to these sectors. 4. Is the food sector geared towards export or domestic consumption; what is the balance? Currently, in trade facilitation of agricultural products to international markets, MAFF has negotiated and prepared some protocols on SPS requirement, such as: - SPS requirement protocol for banana and mango export to China - Being negotiated SPS requirement protocol for mango export to Japan - Finalized negotiation on SPS requirement protocol for eight commodities of fruit (grapefruit, longan rambutant, jack fruit, yellow orange, guava, orange) export to Vietnam. Cassava The area under cassava more than doubled in the years 2005–2013.16 By mid-2019, cassava plantations covered 400,000 hectares.17 A lack of processing factories in Cambodia means there is little value added, however. Instead of exporting products such as cassava chips, mostly unprocessed cassava and cassava flour is exported to Thailand (the largest market), Vietnam and China. Cambodia's raw cassava is processed in these countries and re-exported. In the first 7 months of 2019, Cambodia exported 960,550 tons of dried cassava and 612,200 tons of fresh cassava to Thailand and Vietnam. It also exported 33,287 tons of cassava powder to Vietnam, China, The Netherlands, the Czech Republic, Canada, Italy and India.18 Cashew nuts In the first 7 months of 2019, Cambodia exported 167,285 tons of cashew nuts to Vietnam, Russia, China, South Korea, Myanmar, Peru and Saudi Arabia.19 The country has set a target of 1 million tons. As of mid-2019, cashew plantations covered 170,000 hectares.20 Corn Corn has faced falling prices and falling export demand in recent years.21 Prices in 2014 were 40 percent below those 49

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of 2013. Battambang leads Cambodia's corn production with over 27,000 hectares. On average, farmers are producing up to 4 tonnes of corn per hectare.22 Lack of storage silos is a major problem.

Cambodia is also able to export cattle, pigs, chickens, macaque monkey, meat products, some native animals, animal feeds, and milk to foreign countries. In total, over the last five years, Cambodia exported 43,757 cattle, 109,838 breed pigs (sows, breeders, piglets), 56,000 breed chicks, 77,646 Rhesus macaque monkey, 7,063 tons of dog food, 18,604 tons of dried beef skin, and 8,009 tons of milk. In 2018, Cambodia exported 6,786 cattle, 5,505 breed pigs, 10,472 Rhesus macaque monkey, 1.275 tons of dried beef skin, and 7,558 tons of milk.

The rubber export in 2018 achieved 217,500 tons accounted for USD 287 million compared with 188,832 tons in 2017 and accounted for USD 299 million, the export of rubber production increased to 28,668 tons, equivalent to 15.18%. But the rubber revenue decreased about USD 12 million, equivalent to 4.16%. The average exported rubber prices of 2018 accounted for USD 1,319/ton compared with USD 1,585/ton in 2017, decreased USD 267/ton, and equivalent to 16.83%.

5. Regarding cultural/institutional aspects and gastronomy, what are the favourite or traditional foods? Is there formal data available? Are there representative national dishes? How are meals typically eaten?

Average meals typically consist of more than one dish and ideally contrast flavours, textures and temperatures within the meal using plenty of herbs, leaves, pickled vegetables, dipping sauces, edible flowers and other garnishes and condiments.

Amok (steamed coconut fish in banana leaves): A creamy coconut milk curry traditionally prepared with freshwater fish. Steamed and served in delightful little banana-leaf boats.

Lok lak. Cubes or slices of beef marinated in paprika, Kampot pepper, tomato, fish sauce, and other flavours. Served with rice or french fries, and a soft fried egg on top.

Lap Khmer: Lime-marinated Khmer beef salad

Kuy teav. Classic Cambodian noodle soup featuring a complex beef or chicken bone broth, vermicelli noodles, and slices of meat and/or meat balls. If your hotel doesn't provide breakfast (or even if it does), this makes for a perfect traditional Khmer breakfast at one of the city's markets.

Bai Sach Chrouk. A simple dish of thinly sliced, charcoal-grilled pork (sach chrouk) served with rice and pickled veggies. Another breakfast favourite.

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Useful Information also available at: https://gfc.ucdavis.edu/profiles/rst/khm.html

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BOX 3. COUNTRY CONTEXT - THAILAND Country Facts: Population (2018, est.): 68,015,000 MYANMAR Total area: 198,117 square miles (513,120 sq. km) LAOS Population density (2018): 343.3/square mile (132.6/sq. km) Urban/rural population (2018): urban 49.9%; rural 50.1% Life expectance at birth (2017): 71.7 years (male); 78.3 years (female) Literacy: (Percentage of population age 15 and over literate) 94.7% (male), 91.2% (female) GNI, per capita (2017, U.S. \$): 5,960 (Source: Britannica.com) CAMBODIA SOUTH CHINA SEA MALAYSIA INDONESIA 1. What are the main geographic and economic statistics that relate to agriculture and food production?

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60		foodi	Co-funded by the Erasmus+ Programme of the European Union
General	Information		Land Use of Thailand
Surface area	$513120 \ \mathrm{km^2}$	TE	 Paddy Field 11.27 million ha Field Crop (5.02 m ha) Cassava 1.70 million ha Sugarcane 1.67 million ha
Capital	Bangkok		Maize 1.65 million ha Perennial Crop (4.42 m ha) Para Rubber 3.31 million ha Oil Palm 0.60 million ha Eucalyptus 0.51 million ha
National statistical office	National Statistical Office of Thailand	A.	□ Orchard (1.54 m ha) Mixed Fruit1.16 million ha Coconut 0.19 million ha Longan 0.19 million ha
60	Type of A	foodi griculture in Thail:	Co-funded by the Essenser Pogaseme of the European Union
 Main export (Rice, tapioc pineapple Forestry and (40% of the a Fishery production (freshwater fit animals a Livestock production (chicken, eggs) 	t item a, natural rubber, pale e.) timber products rea in Thailand has b ucts isheries, including far and saltwater fisherie oducts s, and pork)	m oil, maize, soybean a een designated as fores m breeding of aquatic s)	and at)

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Activity: Collaboration is Key. Global and corporate perspective of the Food Industry.

Objective: The UCD Institute of Food and Health has strong links with industry, enterprise and government agencies. Central to the Institute's philosophy is the translation of its research into commercial, economic and societal impact. This presentation by given by Professor Frank Monahan (below).



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UCD's Institute of Food and Health

UCD is a Leading Research Intensive Global University



6 priority research themes

14 subjects in top 100 QS rankings 2019

Veterinary Science – top 50 Sports – top 50 Agriculture – top 100

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4	Over 1,000 companies collaborate on research	NovaUCD, the Centre for Innovation & Entrepreneurship, has supported over 250 start-ups	NexusUCD, the Industry Partnership Centre, houses companies who want to operate in close proximity to UCD
Â	250 partner companies fund research		Industry Collaborations

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UCD Expertise - Draws from many Disciplines

UCD Institute of Food and Health



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UCD Institute of Food and Health



Infrastructure Spans the Food Chain





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Goal 1: To be international leader in Food and Health research

Goal 2: To increase our partnerships and collaborations with leading international researc institutions

Goal 3: To translate our research t impact positively on the economy industry and society





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IFH - industry links



	Abbott Nutrition	CARBERY	Coca Cola	kepak		FOODS	MeadJohnson
Cereal Partners	Dairygold	DANONE	DAWN	Nestlē	Nestié Health Science	OXOID	Pfizer
DAWN MEATS	DIAGEO	Ö DSM	glanbia	PHILIPS	Wyeth		

https://www.ucd.ie/foodandhealth/about/whowelinkwith/

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http://www.fhi.ie/home/



http://www.fhi.ie/about-us/our-partners/

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S http://www.fhi.ie

FHI - Food for Health Ireland - Dublin

Technology Centre

Food for Health Ireland (FHI) unites world-class science and industry expertise to improve health through innovation in food. Its purpose is to identify novel ingredients coming from milk to develop functional food ingredients that will offer health benefits to consumers.

FHI links world-class academic research with industry vision for the potential of successful market innovations. The industryfocused research strategy within FHI includes the identification, development and exploitation of novel milk-derived bioactive compounds for improving health and wellbeing. FHI also provides a pipeline for the development of new functional food ingredients and products with validated health benefits for consumers.

The FHI approach is to work with Irish food industry partners and in close connection with scientists. FHI has built a unique bridge between high-class research organisations and industry needs.

FHI also provides a contract research facility for small and large global food companies utilising our competencies, resources and technologies. This service provides a gateway to academic research in Ireland and supports open innovation. FHI has completed over 60 projects of this kind since 2008.

Research areas:

Technology and healthy cheeses Infant nutrition Appetite modulation Glycaemic management Performance nutrition and healthy ageing

Performance nutrition and healthy ageing Research performed by:

Teagasc Food Research Centre, Moorepark, Fermoy, Co. Cork University of Limerick University College Cork Dublin City University The culmination of academic-industry collaboration is achieved by Food for Health Ireland which aims to improve health through innovation in food.

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The Collaboration is Key session at the UCD Global Lounge culminated in a presentation by two students, of their Final Year Professional Work Experience (PWE) at Glanbia Ingredients, Ireland, and the Department of Agriculture, Food & Marine.

Study visit participants returned to FS1.08A for the remainder of the first day.

Study visit participants were divided into 5 groups to achieve a balanced between nationality, seniority and expertise level. When in these five groups they were engaged by allocation of a series of Worksheets to emphasise the participative nature of the visit. The purpose of these worksheets was to guide participants through the initial stages of the Curriculum Development Process. To facilitate communication of each groups work in an efficient manner and to also facilitate merging of the groups work into common statement and outcomes, the five groups were each assigned to a group Gmail account.

GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5
Rose	Aiza	Siti	Era	Fauziah
S. Ramesh	Ramesh	Fatin Saiha	Margaret	Ling
Isa	Noriza	Mazidah	Ain	Vannaro
Rany	Koemseang	Phyrum	Tara	Theal
Rottana	Eleni	Hasika	Loek	Serey
Reasmey	Bunlay	Anil	Loc	Kongkarn
Mutita	Punnanee	Ioannis	Francesco	Stefanos

Google drive <u>www.google.com</u>

group1foodi@gmail.com group2foodi@gmail.com group3foodi@gmail.com group4foodi@gmail.com group5foodi@gmail.com

Password: FOODI2019

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The worksheets to be completed by the study visit participants are illustrated below (Figure 7).

		of the European Union
Extra Curricula In Asia	Extra Curricula in Europe	Skills Needs/Industry Feedba

Worksheet 2: 'Country Context'

Please note the most important contextual drivers that will influence the FOODI programme.

Malaysia	Thailand	Cambodia

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Worksheet 2: 'Country Context'

Are	any common to all three countries? Please	list.									
What are the main differences, if any?											
Malaysia	Thailand	Cambodia									

	Use your notes from worksheets 1 and 2 to inform the FOODI Programme's Vision & Values Statement
Purpose(s)	
Education and discipline values	
The nature of the earning environment for students	
The key approaches to	

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Worksheet 4



Group Exercise: Draft programme outcomes



Figure 7. Study visit participants were asked on Monday to complete the above worksheets in preparation for the Wednesday morning session to consolidate both the Vision and Values Statement and the Programme Outcomes (for reference see the Curriculum Development Process in Figure 1, where the Vision & Values and Programme Outcomes are elaborated at the start of the Curriculum Development Process).

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Deliverable 2.2 Study Visit to UCD, Dublin

Prior to the study visit FOODI Consortium Partners had been given an Excel spreadsheet file that they were asked to complete; they were required to provide up to 10 Programme Outcomes for each of the original two streams in the FOODI MSc proposals – the Business of Food Processing and Food Processing & Health. These are detailed in Figure 8.

		foodi	Co-funded by the Erasmus+ Programme	2
		SRASMUS+ CBHE	of the European Onion	
ĺ		First name:		
		Last name: Title (Mr/Mrs/Ms/Dr/etc)		
		To be addressed as:		
		Name of Higher Education Institution (HEI):		
		(Please complete the fields above to assist in preparation of the Study Visit to UCD)		
				2
		FOODI: the Business of Food Processing	FOODI: Food Processing and Health	
	2	Graduates of this programme will be able to:	Graduates of this programme will be able to:	
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	2			
		Please:		2
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		Please: Identify 10 PROGRAMME OUTCOMES that you would like the FOODI MSc Programm HIGHLIGHT (in yellow) YOUR MOST IMPORTANT OUTCOME.	to achieve to achieve Use material and process knowledge to solve problems.	
		Please: Identify 10 PROGRAMME OUTCOMES that you would like the FOODI MSc Programm HIGHLIGHT (in yellow) YOUR MOST IMPORTANT OUTCOME. Co-funded by the Erasmuse Programme of the European Union	to achieve to achieve Use material and process knowledge to solve problems. Identify efficient production processes.	
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Figure 8. (a) Programme Outcome template document that study visit participants were sent by email prior to the study visit to UCD. (b) From the responses to the email containing the Programme Outcomes draft template document, the programme Outcomes were compiled and collated, duplicates identified, and they were then merged into a list of the most common or 'core' desirable Programme Outcomes (on left) and secondary outcomes (on right) that are listed.

The purpose of writing Programme Outcomes, and its inherent value in the context of developing and designing a Curriculum had been outlined to FOODI colleagues by email previously (the same email that had included the draft template for Programme Outcomes, above). It was delivered as follows, and explains the rationale,

Dear FOODI colleagues,
The FOODI Study Visit to University College Dublin in September is drawing nearer and to ensure a productive and worthwhile visit we need to engage you in our preparation.
One key aspect of the Curriculum Development Process is to develop the Programme Outcomes for the FOODI MSc Programme.
What is a Programme Outcome?
"A programme outcome is what a typical student is expected to be able to do on completion of the programme. The programme outcomes are the knowledge, skills and attitudes students should possess when they graduate from a programme".
Key characteristics of Programme Outcomes are that they should be:
1. Student-focused, i.e. that the student should be able to
2. High level outcome, i.e. they are greater in scope and complexity than course/module outcomes
3. Guided by professional, disciplinary, inter-disciplinary and institutional graduate attributes
4. Informed by international, national and institutional level guidelines
In developing Programme Outcomes one useful approach is to imagine that you meet graduates of the FOODI MSc Programme three years after graduation. They discuss what they learned from the programme and what they really valued, especially as it relates to their current employment and further studies.

We attach the template we would like you to compete for the two programmes listed in the FOODI proposal (FOODI: the Business of Food Processing and FOODI: Food Processing and Health).

The programme outcomes needed further development during the study visit and participants were given guidance on Monday. This is outlined on the following series of slides:

In developing Programme Outcomes one useful approach is to:

.....imagine that you meet a graduate/s of the FOODI MSc Programme three years after graduation. They discuss what they learned from the programme and what they really valued, especially as it relates to their current employment and further studies.

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Why write programme outcomes?

- To be clear and transparent to stakeholders
- To aid choosing appropriate teaching, learning and assessment strategies
- To develop coherence in the programme
- To inform the design of the sequencing of learning activities

Tips on writing outcomes

 Articulate a high-level ability that the student will have developed
 Use action verbs
 List in order of their importance
 Decide if transferable skills are to be specifically stated or embedded

Examples of Programme Outcomes from the UCD Online MSc in Food, Nutrition and Health were given, as follows:

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Examples of outcomes

online MSc in Food Nutrition and Health

On successful completion of the programme students should be able to:

- Integrate and apply knowledge of key principles underlying Food Science, Nutrition and Health
- Demonstrate competence to acquire, organise, analyse, integrate and critically review information from a wide range of sources relating to issues in Food, Nutrition and Health and construct and defend reasoned conclusions
- Think independently, show initiative, evaluate and select appropriate and reasoned approaches to solve problems
- Be skilled in proposing and developing solutions to nutrition-related problems as they relate to human health and disease and communicate these to stakeholders, at a professional and appropriate level, utilising information technology and a range of approaches
- Demonstrate a critical awareness of principles relating to scientific integrity and ethical issues in Food Nutrition and Health
- Use the principles of scientific inquiry to research a particular Food Nutrition and Health issue that merits a detailed research investigation
- Have a working knowledge of the tools that enable efficient team work, in order to generate

Further guidance was provided to participants by means of providing core concepts of how Masters students should 'be' and the personal attributes they should exhibit after completing a Masters Programme. These core personal attributes are illustrated and defined below:





Study Visit Day One Monday, September 16, 2019. Time: 14.00-17.00

Activity: Tour of Laboratory Facilities

Objective: to demonstrate to study visit participants the range of laboratory facilities and equipment available in wet chemical laboratories, instrumental analytical laboratories, food processing analytical laboratories and food processing pilot plant and wet processing rooms.

List of Facilities and Equipment: 1. Food Science Annex Basement: FSLG-03

- Ohmic heater
- DIL PEF unit
- Ultrasonic probes
- GEA Niro Soavi Panda Homogenizer
- Armfield's miniature-scale FT74X UHT/HTST system
- Armfield's FT22 Rising Film Evaporator.

Top Floor:

FS2-02

- 2x Small scale Batch Ohmic Heaters
- Cooled Electrodes Ohmic Heater
- Radiofrequency Heater
- Continuous Microwave processor
- UV Pulsed Light system
- UV Light box
- LED UV refrigeration Unit
- UV fluidized bed
- NUTRI-PULSE[®] E-COOKER[®].



Overall Summary of Day One:

Study visit participants were introduced to each other, were given an introduction to University College Dublin, were given an overview of the outcomes of FOODI WP1, a background and context for each Asian Partner country, an overview of the collaboration between UCD and some of Irish largest food companies and a visit to the Food Processing facilities at UCD. Participants were introduced to the formal Curriculum Development Process and also asked to begin to think about the initial aspects of this process: the Vision and Values statement and the Programme Outcomes.

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Study Visit Day Two

Tuesday, September 17, 2019

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Study Visit Day Two

Tuesday, September 17, 2019. Time: 0900-13.00

Activity: Creativity and the Ability to Innovate – Learn by Doing

Innovation Academy workshop

This was a whole morning workshop which was led by entrepreneurial experts from the UCD Innovation Academy Colman Farrell, Jacinta Owens and Kathleen Lonergan-Erickson, which took place in the Shackleton Lounge, a space dedicated to creative learning. It involved the whole FOODI group in a very active, hands-on, enjoyable and collaborative way.

The aim of the workshop was to discover the 'Why?' and 'How?' of developing an innovative mindset in an experiential way.

1. The 'Why?'

The underlying message given can be summed up in the following quote:

"We cannot solve our problems with the same thinking that created them" (Einstein)

There was a recognition that going from Industrial Revolution 1 to 4 requires a new way of thinking and therefore a new type of education. Graduates now need a sense of purpose - what kind of society do they want to live in? What are the challenges facing society that they can help solve and what are the opportunities? If there is a need to think differently, how is this done?

A nice example to highlight this was the activity called 'Lego® Ducks'. Everyone was given the same Lego® bricks and asked to make a duck in 2 minutes. Thirty-six people who all had the same bricks and instructions each made a different duck, demonstrating that everyone was creative but nobody used any of the Lego® bricks upside down - why not? We all have preconceived ideas and we need to shift our mind-sets - need to think about how things can be done differently, what are the other possibilities.

The main traits necessary to develop an innovative mind-set were highlighted, for example questioning, listening, observation, curiosity, idea generation, collaboration, learning from failure and action, which led to discussion as to how you one might teach and develop these traits in future FOODI students.

2. The 'How?'

A number of mini challenges and activities introduced tools to the group that could potentially be employed within the proposed FOODI programme.

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Activity	Description	Learning							
'Write a story'	Asked to get into pairs and given one blank page between them. Asked to draw a story, taking it in turns to drawn pictures in total silence.	might feel like - you have a blank page, no instructions, you have to work with someone that might have a different idea in their head to you and they might not understand where you are going with your story and go down a different path. In reality, your original idea is more often than not changed along its journey from idea to product, and it is important to accept that feeling.							
'Paperclip challenge'	Individuals were asked to come up with as many ideas as they could for the uses of a paperclip in 2 minutes and write them down on post it notes. Everyone at each table then presented their ideas to each other and the favourite idea for each table was chosen and shared with the whole room.	Introduced 'Brain-writing', a tool that allows for individuals to have their voice heard in situations where they may feel shy or fearful or when there may be a dominant member of the group. The time pressure and lack of any physical materials allowed for imagination. Sometime taking too long can lead to overthinking and having materials can be restrictive. This allowed for wacky or ridiculous ideas to be created and this was seen as acceptable and nobody felt awkward or embarrassed. The more unbelievable the better, this was encouraged and really allowed people to think beyond constraints.							
'Mix' and 'Match'	Two sets or random pictures were shown and individuals were asked to choose one from each set and create a new product. They would then present their ideas and the group would select one to develop and present back to the group, all in 10 minutes.	A fun way to generate lots of ideas. Demonstrated the need to act quickly as too much time spent on picking out the objects meant less time to get creative. Again, it allows for some ideas to be silly which encourages everyone to feel comfortable taking part. It allowed the brain-writing tool to be used again, allowed for collaboration as some ideas were added to/amended until an agreed one was decided. Also demonstrated different ways of presenting your idea/pitching - the power of actually making a rough and ready prototype, using a role play or making an advert or a jingle to get your message							

Table 1. Challenges and activities at the UCD Innovation Academy.

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		across.
'Tin Foil Hats'	Each group picked one person to act as a 'customer'. They then had 5 minutes to ask as many and whatever questions they wanted. The 'customer' then left the room and the rest of the group make a tin foil hat they think the customer would love.	This very quick process took everyone through a framework called the 'Design Thinking Process' without them even realising it. The key stages are understanding the customer (empathy), coming up with ideas based on what you have learnt (ideation) and making an actual product and tweaking it to get it right (prototyping and iteration). Following this framework ensures the best solution and the more practice using it, the better it works. For example, if doing it again you realise you would be more likely to ask the right type of questions and really listen to the customer.



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Figure 9. Group collaboration at the 'Learning by Doing' session at the UCD Innovation Academy.

The concept of 'reflective practice', asking What? So What? Now What? was then introduced which allowed the FOODI academics to explore ways in which they might re-imagine their approach to education and introduce new teaching practices into the proposed FOODI programme.

Because the facilitators had experience of teaching in Asian cultures they were very aware of the time pressures facing both the academics and students and also that some of the desirable traits, such as treating failure as a powerful means to success, might be somewhat uncommon.

3. 'Learn by doing'

By experiencing the workshop first hand, the FOODI academics could appreciate how the future FOODI students may feel embarking on a course which develops creativity and innovation.

By asking everyone at the start to take a moment to express how they were feeling in just one word, meant there was a recognition that some members of the groups felt anxious, nervous, unsure but also enthusiastic and excited (as would the students be). It was also important to recognise that the FOODI group, although all academics, were from diverse disciplines and backgrounds and that not all members of the group knew one another and may feel uncomfortable giving ideas out loud. A key message was therefore the importance of creating a *'safe space'*.

All of the activities at some stage required the participants to work together in teams and collaborate. How ideas evolved with the input of others was shown and the group were also asked to think about who they already know that in their own community that have already demonstrated the key traits and that they could call on to talk or speak to students.

The experiential approach highlighted in a very real way how any programme that aims to develop creativity is most successful when the environment is supportive and a 'safe space' is created. It also allowed the participants to appreciate the importance of team work, collaboration and therefore the necessity to provide the opportunity for students to *build a community* to support each other and collaborate. In this workshop, some community building exercises at the start allowed for this and the groups were mixed up and everyone was encouraged to actively participate, which they did!

Throughout he workshop, time was taken to reflect specifically on the FOODI programme. The group were asked to think about what their 'Hopes' and 'Concerns' for the programme were and also what they believe a 'Successful FOODI programme' would mean both personally and for their institutions. All of these have been captured (photos) and the plan is to refer back to these along the project journey.

A key learning from WP1 was the identification that innovation was a gap in the current offering and so it was very important that this workshop was included as part of this study week. This workshop offered

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approaches that could be incorporated into the design of the FOODI programme in order to build skills and competencies for innovation by way of a highly experiential, practical and action based programme.

Activity: 'A Tale of Two Masters'

This session was given by Dr. Aideen McKevitt.

Objective: to provide an overview of how two of the UCD online MSc programmes (MSc Food Regulatory Affairs and MSc Food, Nutrition & Health) have evolved since their original development.

Outline & Key Findings: Aideen presented the rationale and impetus for the Food Regulatory Affairs MSc programme. Due to the globalisation of food supply chains, and the lack of harmonisation of standards, there was an increased risk profile of foodborne disease outbreaks. In this context, professionals in the food industry would need to have an intimate knowledge, understanding and higher order cognitive abilities to face the inherent challenges that food industry roles in general, and specifically those related to food standards regulation would present. Here again below, a selection of the slides presented are instructive of the content that was delivered in the session.



Innovation Measurement Medicine SCIENCE POLICY LAW Trade Safety Liability Enforcement

as applied to the regulation of the entire food chainthe "Farm to Fork" approach

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Global Food Supply Chain



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MSc Food Regulatory Affairs Background



- Need for MSc in Food Regulatory Affairs- from Global Food Industry
- No FRA programme globally included with other positions
- Curriculum Design funded by European Commission
- Academic partners
 - IUNA Irish Universities Ulster, Cork, Trinity College Dublin, UCD
- Industry Partners
 - Unilever, Nestle, Coca Cola, Mars,

Starting Point

- Profile of an MSc FRA Graduate
- A graduate from this MSc will be able to demonstrate the following skills
 - Knowledge and Understanding
 - Intellectual Skills
 - Transferable Skills
 - Communication Skills



EDUCATIONAL AIMS AND OBJECTIVES OF THE COURSE PgC- provide a focussed overall view of the system of food regulation in Europe. Achieved through completion of Modules x and y

PgD/MSc- provide students with a thorough and in- depth understanding of the elements that make up the food regulatory process. This will include aspects of food science, health, law, ethics, policy, economics and politics.

MSc research project will integrate material from the coursework and apply it to an issue of present or future concern to stakeholders in the food sector.

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The course provides opportunities for students to achieve and demonstrate the following learning.

- **Competence** in Food Regulatory Affairs to meet the local, regional and national and international needs of food sector stakeholders.
- Knowledge base and skills necessary to operate effectively in a range of posts which require a food regulatory background.
- **Development** of effective interpersonal and transferable skills.
- Flexibility and responsiveness in Food Regulatory Affairs, prepared for the workplace and changing patterns of the food sector.
- Capacity for effective, critical evaluation and analysis.
- **Contribution to knowledge and understanding** of food regulatory issues through the application of research and evidence based practice.

Knowledge and Understanding



- K1 Discuss the evolution of the European Union; *
- K2 Explain the rationale for changes in EU food policy
- K3 Discuss the concept of globalisation of the food supply
- K4 Explain he process and components of risk analysis in the food supply;

<mark>K5 Discuss</mark> the nature of the relationship between nutrition and health

K6 Integrate the elements of the "Farm to Fork" policy of regulation of the food supply;

K7 Use the principles of scientific inquiry to research a particular

INTELLECTUAL SKILLS



- I1 Analyse concepts, principles, practices and theories in a rigorous and critical manner.
- 12 investigate and evaluate of risk analysis questions using appropriate practices and tools
- 13 Identify issues and create solutions, gaining the skills of problem solving necessary for effective practice;
- 14 Undertake original research in a selected regulatory area;
- **I5** Debate issues on food policy. Explore and evaluate alternative positions and devise strategies for appropriate implementation.

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INTELLECTUAL SKILLS



- I1 Analyse concepts, principles, practices and theories in a rigorous and critical manner.
- 12 investigate and evaluate of risk analysis questions using appropriate practices and tools
- **I3** Identify issues and create solutions, gaining the skills of problem solving necessary for effective practice;
- I4 Undertake original research in a selected regulatory area;
- **I5** Debate issues on food policy. Explore and evaluate alternative positions and devise strategies for appropriate implementation.

PROFESSIONAL/PRACTICAL SKILLS

- **P1** Specify, design, and construct particular courses of action in the short and long term on food regulatory issues to stakeholders;
- **P2** Choose most appropriate approach to solving practical problems involving aspects of food regulation that impact on the organisation;
- **P3** Evaluate actions and plan systematic change using appropriate evidence and information regarding quality management systems;
- P4 Enhance the effectiveness of a development team;
- **P5** Construct reflective accounts, reports, and reviews for various audiences scientists, regulators, food industry, consumers.

TRANSFERABLE/KEY SKILLS



- S1 Solve problems through collaboration
- **S2** Effective use of information retrieval skills and learning resources;
- S3 Communicate effectively using various media for variety of audiences;
- **S4 P**lan and manage own learning and development including time management and organisation skills;
- **S5** Collect, analyse and interpret research data;.
- S6 Identify key issues and to create solutions
- S7 Appreciate the need for continuing professional development;

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MSc Programme Development

- Introduction to Food Regulation
- Risk Analysis
- International Food Regulation
- Farm to Fork Regulation of Food Chain
- Current issues in Food Regulation
- Food and Health
- Research Design and Statistics
- Research Project

- For each module developed module outline and lectures
- Approached global experts to develop lecture content
- Mode of delivery from various EU Member States
- Internet delivered distance taught
- Evolved to include MSc Veterinary Public Health

Lecturers

- Head of Codex Alimentarius
- Commissioner for Agriculture EU
- Officials from DG Sante EU Commission
- Head of Food Safety Authority of Ireland
- · Chief Veterinary Officer Northern Ireland
- Food Industry Food regulatory Affairs Experts
- Food Lawyers
- Model requires Support of E -tutors
- PROBLEMS Update lectures







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Pedagogy

• Social constructivist learning theories, key to student learning is to encourage students to engage online in in-depth discussion of the content of FRA modules – links to external content, embed videos, asynchronous and synchronous tutorials recorded.

Enquiry and Problem Based Learning

promotes personal research... student becomes more familiar with the resources at their disposal, e-journals, databases Opportunity to support one another in research and explore different avenues of information. Experience one of interchange where students share opinions, research and experience in order to achieve an end result.

Online delivery Links to External Resources





https://audiovisual.ec.europa.eu/embed/index.html?ref=l-133640&lg=undefined

http://www.fao.org/fao-whocodexalimentarius/resources/multimedia/video -audio/en/

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Assignment

You are an official of a food safety agency in a **non-EU** country that has substantial exports and imports of food to and from the EU. Review the annual reports of Food Safety Audits and Analysis for the past three years and give an assessment of the main areas of weaknesses identified by the Office in control systems in countries exporting to the EU.



https://audiovisual.ec.europa.eu/embed/index.htm l?ref=l-133640&lg=undefined

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MSc Food Nutrition and Health

- UCD Online 2013
- MSc Food Nutrition and Health
- New President -traditional
- Developed existing resources in Food Science and Nutrition
- Evolved in response to student demand.
- Student feedback
- New modules developed
- 2 pathways
- FNH and Nutrition

MSc Food Nutrition and Health

- Presently >200 students global
- Change of Career
- Learning environment Brightspace

Activity: Laboratory Tour of Food Science Laboratories in UCD.





Study Visit Day Three

Wednesday, September 18, 2019

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Wednesday, September 18. 09.00-13.00 Activity: Consolidation of FOODI MSc Programme Outcomes

Table 2. List of Vision and Value Statement components/decision criteria developed by each of the five groups and also including an aggregate of each statement component. All study visit delegates subsequently voted on which of each of the Vision and Value Components they preferred. In each case, the statement component/decision criterion with the highest number of votes was chosen as the favoured option. The voting matrix is illustrated in Table 3.

Decision Criterion	Group 1	Group 2
Purposes	Be able to demonstrate advanced knowledge and skills in the interdisciplinary field of food science and technology with strong technical capability to contribute in the transformation of the food industry through creative, innovative and professional approach The programme will expose	Enhance students' capability in food science, engineering and technology with entrepreneurial mind in order for them to be able to demonstrate their leadership skills as a key player in the food industry. In addition, the students would be able to apply their knowledge and skills to add value to the current products and services and answer the market needs The program will allow students to
discipline values	students with core and elective courses which enable students to critically interpret, analyze, synthesize and evaluate aspects of research activities relating to food science and technology.	develop critical thinking, business ethics, soft skills, digital IT approach, hands-on experience but also act creatively in terms of product design. The program should allow the students to creatively enhance the current process and enable them to solve the industry problems. Students should develop good interpersonal skills and ethics.
The nature of the learning environment for students	e-learning, field trips, self- directed projects, laboratories, industrial attachment	We will provide learning opportunities in a variety of methods: Blended learning, field trips, laboratory work, Project based learning (Group projects mostly), internship provision to identified food industry companies, student exchange experience - perhaps at a later stage Action research - based on the real problems in the industry
The key approaches to teaching, learning and assessment	Academia-industry collaboration, diverse learning, critical thinking, projects, presentation, prototype development.	Mentorship from industry professionals, Self-learning, group studies & projects, lectures & presentations, case studies, intellectual discourse (i.e. invite the industry players to share their insights) Presentation and discussion (i.e. to enhance the students' interpersonal skills)

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Decision Criterion	Group 3	Group 4
Purposes	To enable students to illustrate	Aim of the programme is to enable
	the food process engineering,	students to meet the challenges of the
	food safety, hygiene and	food sector developing professional,
	quality, packaging and labelling,	personal and entrepreneurship skills to
	design and entrepreneurship	be successful in the fast changing food
	design and entrepreneurship.	global level it provides a platform to
		add value to traditional food products
		for domestic and international markets.
		It also enables students to create new
		products from conventional products
		through innovation.
Education and	The program will allow students	The programme will enable students to
discipline values	to develop the knowledge in	develop the specific knowledge and
•	food innovation and	skills in areas including:
	entrepreneurship, to employ	e feed processing.
	communication problem	 food processing, food putrition;
	solving and critical thinking; to	 food safety and quality:
	enable them to devise	 problem analysis and
	independent research and	synthesis;
	analysis; to adhere to legal,	 analysis and ethical
	ethical and professional codes	experiment design;
	of practice.	innovation leadership;
		business and management
		orientation;
The network of the	Variation of anyironments:	The transpational pature of EOOD will
The nature of the	classroom lecture	provide students with a
learning	webinar	national/international based learning
environment for	on-line tutorial	environment, in which traditional
students	laboratory	classroom and lab activities substituted
	field trip	and blended with e-learning, field trip,
	case studies/simulation	self-directed project and professional
	workshop/seminar	internship will be enriched by active
	internship	learning, learning-by-doing, computer
The key	Teamwork collaboration	and internet virtual based learning.
тпе кеу	communication critical	learning and assessment include
approaches to	thinking, assignment, research	national/international cooperation and
teaching,	project	communication, team-working and
learning and		critical attitude, by means of case
assessment		studies aligned to regional challenges,
		report presentation, even "pitch-style
		presentation". This will equip graduates
		with the knowledge and soft skills
		entrepreneur and inpovative leadership
		in the food industry.

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Decision Criterion	Group 5	Aggregate
Purposes	Aims to enable students to be more innovative, entrepreneurial and global in food processing industry though a more holistic, integrated and professionally developed academic progress	To empower students, through holistic application of advanced professional knowledge and skills in all aspects of food science, technology and engineering, combined with an entrepreneurial and innovative approach and worldview to seek to add value, continuous improvement and thereby lead transformative change and development in the food industry, while remaining customer focused and providing diverse, safe and nutritious food products.
Education and discipline values The nature of the learning environment for students	The programme will allow students to master subject specific knowledge such as innovation in food processing and supply chain, soft skills in food industry and entrepreneurial skills in managing consumer behaviour and global market. We will provide learning opportunities in a variety of environments including classroom, laboratory ("FOODI Center of Excellence " in each partner institution to run MSc	The programme will expose students to core and elective courses which will enable them to critically analyze, synthesize, evaluate, interpret and communicate aspects of the food business sector in a professional and ethical manner to foster creativity and innovation and thereby enhance development and resolve challenges. The learning will be a transnational, diverse, adaptive, innovative blended learning environment using a variety of methodologies and tools including traditional classroom lectures, laboratory work field trips case studies
	partner institution to run MSc programmes and vocational training courses) , digital learning (MOOC) field trips, self-directed projects, community service learning, and professional work placement.	laboratory work, field trips, case studies and simulations, team-based learning and project work, self-directed and autonomous learning, workshops, seminars, professional industry internships as well as webinars, on-line tutorials and include the auspices of FOODI Centres of Excellence for vocational training courses and digital learning (MOOCs).
The key approaches to teaching, learning and assessment	Design thinking, teamwork, collaboration, communication and critical thinking are integral components of the programme.	Academia-industry collaboration, diverse learning, critical thinking, projects, presentation, design thinking and prototype development, teamwork, collaboration, discourse and debate, group-based project learning, assignment, mentorship, case studies aligned to regional challenges but with a national and international context.

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Table 2. (continued)

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is; key approaches to		Apprepate	To empower students,	through holistic	application of advanced	professional knowledge	and skills in all aspects of	food science, technology	and engineering,	combined with an	entrepreneurial and	innovative approach and	worldview to seek to add	value, continuous	improvement and thereby	lead transformative	change and development	in the food industry, while	remaining customer	focused and providing	diverse, safe and	nutritious food products.	The programme will	expose students to core	and elective courses which	will enable them to	critically analyze,	synthesize, evaluate,	interpret and
nvironment for student		Group 5	Aims to enable	students to be more	innovative,	entrepreneurial and	global in food	processing industry	though a more	holistic, integrated	and professionally	developed academic	progress										The programme will	allow students to	master subject	specific knowledge	such as innovation in	food processing and	supply chain, soft
s; nature of the learning el		Group 4	Aim of the programme is	to enable students to	meet the challenges of	the food sector	developing professional,	personal and	entrepreneurship skills to	be successful in the fast	changing food processing	industry at regional and	global level. It provides a	platform to add value to	traditional food products	for domestic and	international markets. It	also enables students to	create new products from	conventional products	through innovation.		The programme will	enable students to	develop the specific	knowledge and skills in	areas including:	food processing;	food nutrition;
and Discipline Value:		Group 3	To enable students	to illustrate the	food process	engineering, food	safety, hygiene and	quality, packaging	and labelling,	traceability towards	innovative design	and	entrepreneurship.										The program will	allow students to	develop the	knowledge in food	innovation and	entrepreneurship,	to employ the skills
- Purposes; Education		Group 2	Enhance students'	capability in food	science, engineering	and technology with	entrepreneurial mind	in order for them to be	able to demonstrate	their leadership skills	as a key player in the	food industry. In	addition, the students	would be able to apply	their knowledge and	skills to add value to	the current products	and services and	answer the market	needs			The program will allow	students to develop	critical thinking,	business ethics, soft	skills, digital IT	approach, hands-on	experience but also act
is statement components	ng an assessment 16, 2019	Jniversity College Dublin Group 1	Be able to demonstrate	advanced knowledge	and skills in the	interdisciplinary field of	food science and	technology with strong	technical capability to	contribute in the	transformation of the	food industry through	creative, innovative and	professional approach									The programme will	expose students with	core and elective	courses which enable	students to critically	interpret, analyze,	synthesize and evaluate
Vision and value	teaching, learnii Monday, September 1	FOODI Study Visit to L	Purposes																				Education and	discipline	values				

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	aspects of research activities relating to food	creatively in terms of product design.	of analysis, communication,	food safety and quality; problem analysis and	skills in food industry and entrepreneurial	communicate aspects of the food business sector in
	science and technology.	allow the students to	problem solving and critical	syntnesis; analysis and ethical	skills in managing consumer behaviour	a proressional and ethical manner to foster creativity
		creatively enhance the	thinking; to enable	experiment design;	and global market.	and innovation and
		current process and	them to devise	innovation leadership;		thereby enhance
		enable them to solve	independent	business and		development and resolve
		the industry problems.	research and	management orientation;		challenges.
		Students should	analysis; to adhere	entrepreneurship.		
		develop good	to legal, ethical and			
		interpersonal skills and	professional codes			
		ethics.	of practice.			
The nature of	e-learning, field trips,	We will provide	Varieties of	The transnational nature	We will provide	The learning will be a
the learning	self-directed projects,	learning opportunities	environments:	of FOODI will provide	learning	transnational, diverse,
environment	laboratories, industrial	in a variety of	classroom lecture	students with a	opportunities in a	adaptive, innovative
for students	attachment	methods: Blended	webinar	national/international	variety of	blended learning
		learning, field trips,	on-line tutorial	based learning	environments	environment using a
		laboratory work,	laboratory	environment, in which	including classroom,	variety of methodologies
		Project based learning	field trip	traditional classroom and	laboratory ("FOODI	and tools including
		(Group projects	case	lab activities substituted	Center of Excellence "	traditional classroom
		mostly), internship	studies/simulation	and blended with e-	in each partner	lectures, laboratory work,
		provision to identified	workshop/seminar	learning, field trip, self-	institution to run MSc	field trips, case studies and
		food industry	internship	directed project and	programmes and	simulations, team-based
		companies, student	hackathon	professional internship	vocational training	learning and project work,
		exchange experience -		will be enriched by active	courses), digital	self-directed and
		perhaps at a later		learning, learning-by-	learning (MOOC) field	autonomous learning,
		stage		doing, computer and	trips, self-directed	workshops, seminars,
		Action research - based		internet virtual based	projects, community	professional industry
		on the real problems in		learning.	service learning, and	internships as well as
		the industry			professional work	webinars, on-line tutorials
					placement.	and include the auspices
						of FOODI Centres of
						Excellence for vocational

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Deliverable 2.2 Study Visit to UCD, Dublin

training courses and digital

Academia-industry learning (MOOCs).

Design thinking,

Key approaches to

Teamwork,

Mentorship from

Academia-industry

The key

100

w of its



Deliverable 2.2 Study Visit to UCD, Dublin

approaches to teaching, learning and assessment	collaboration, diverse learning, critical thinking, projects, presentation, prototype development.	industry professionals, Self-learning, group studies & projects, lectures & presentations, case studies, intellectual discourse (i.e. invite the industry players to share their insights) Presentation and discussion (i.e. to enhance the students' interpersonal skills)	collaboration, communication, critical thinking, assignment, research project	teaching, learning and assessment include national/international cooperation and communication, team- working and critical attitude, by means of case studies aligned to regional challenges, report presentation, even "pitch- style presentation". This will equip graduates with the knowledge and soft skills necessary to provide professional entrepreneur and innovative leadership in the food industry.	teamwork, collaboration, communication and critical thinking are integral components of the programme.	collaboration, diverse learning, critical thinking, projects, presentation, design thinking and prototype development, teamwork, collaboration, discourse and debate, group-based project learning, assignment, mentorship, case studies aligned to regional challenges but with a national and international context.
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NOTE: The aggregate Vision and Values statement is an amalgamation of the five groups contributions to each decision criterion within the Vision and Values Framework.

Having displayed each of the five groups' Vision and Values statements, together with the aggregate statement, the best criterion (i.e. purposes, education and discipline values, nature of the learning environment for students and the key approaches to teaching, learning and assessments) was voted upon by individuals writing their group number in a matrix which is outlined below. In this way, the most popular statement for each of the four decision criteria was identified.

Table 3. Matrix illustrating how study participants voted for each of the Vision and Values statement components/decision criteria. The decision criterion with the most votes is indicated in bold and encircled. This is also indicated in the rightmost column. Thus, these statements were included in the Vision and Values statement (see BOX ONE).

	Group 1	Group 2	Group 3	Group 4	Group 5	Aggregate	Most Popular
Purposes	14	0	0	0	4	12	Group 1
Education &	0	0	8	3	2	18	Aggregate
Discipline						`	
Values							
Nature of the	0	5	0	0	9	18	Aggregate
Learning							
Environment							
Кеу	0	9	0	0	0	20	Aggregate
approaches to						-	
teaching,							
learning &							
assessment							

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BOX 4. VISION AND VALUES STATEMENT

Purpose: Be able to demonstrate advanced knowledge and skills in the interdisciplinary field of food science and technology with strong technical capability to contribute in the transformation of the food industry through creative, innovative and professional approach.

Education and Discipline Values: The programme will expose students to core and elective courses which will enable them to critically analyse, synthesize, evaluate, interpret and communicate aspects of the food business sector in a professional and ethical manner to foster creativity and innovation and thereby enhance development and resolve challenges.

The nature of the learning environment for students: The learning will be transnational, diverse, adaptive, innovative blended learning environment using a variety of methodologies and tools including traditional classroom lectures, laboratory work, field trips, case studies and simulations, team-based learning and project work, self-directed and autonomous learning, workshops, seminars, professional industry internships as well as webinars, on-line tutorials and include the auspices of FOODI Centres of Excellence for vocations training courses and digital learning (MOOCs).

The key approaches to teaching, learning and assessment: Academia-industry collaboration, diverse learning, critical thinking, projects, presentation, design thinking and prototype development, teamwork, collaboration, discourse and debate, group-based project learning, assignment, mentorship, case studies aligned to regional challenges but with a national and international context.

BOX 5. PROGRAMME OUTCOMES

- Integrate knowledge of food science/technology/entrepreneurship principles for transformation of the food industry to produce quality, safe, sustainable, healthy food.
- Critically evaluate and apply innovative technologies for positive disruption and development of the food industry.
- Conduct research and adhere to legal, ethical and professional practices in food innovation.
- Demonstrate the ability to perform and effectively communicate original research in interdisciplinary areas of food science, technology and entrepreneurship.
- Implement standard analytical and innovative methods including digital technologies, statistical software to monitor the risks and hazards influencing food quality.
- Demonstrate responsibility in planning, resource management, supervision, problem solving and managing work within a team and collaboratively with other teams.
- Analyse the main economic and strategic issues concerning food markets and consumer preferences, creating effective marketing plans for the food industry
- Plan or lead an entrepreneurial venture/ "start-up" or apply intrapreneurial intervention in the food domain.

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Activity: Wednesday 18 September 2019, 14.30-17.00 – Mapping Potential Teaching, Learning (T &L) and Assessment/Feedback Tools

Innovative Teaching & Learning and Assessment Techniques delivered at University College Dublin

Breige McNulty

A lecturer in human nutrition within the UCD Institute of Food and Health, she has spent the last number of years managing the National consumption surveys. Breige's main research interests are in the area of food consumption and using such data to gain an understanding of the impact of foods, nutrients, food ingredients and chemicals on health with a view to underpinning food safety and policy.



Topic: Development of Online Assessment

- Emphasis on learning outcomes where the student is able to critically evaluate information and to communicate that information to a target audience
- Nutritional science is constantly evolving so students need to be critically aware of new information and how to critically evaluate it
- Assessment aligns with learning outcomes. There are 3 assessments: 1) Critique Scientific Paper (20%), 2) Multiple Choice Question Exam (30%), 3) Presentation (50%)
- Students deliver an online presentation (20 minutes) on a real-world topic or issue, and the slideshow must be accompanied by an audio component.
- Masters level student found the presentation a positive learning experience that developed their knowledge and their communication skills.
- Feedback led to the development of instructions for students
- For the lecturer, provides a useful means of assessing how effective their teaching is.
- Questions and Answers
 - Breige was asked how she structures the critique since there is no final exam in her module. She emphasised that students must summarise a scientific paper in 500-700 words, evaluating what are the limitations, the strengths of each section.
 - Breige was asked whether there were rubrics for the assessment which she confirmed. Written, individualised feedback is provided.
 - Controversial topics are chosen.
 - The online module was designed to be assessed individually but because numbers have grown, alternative or group assessments may need to be considered in future.
 - \circ $\;$ Time management is critical but tutors are required to spread the workload.

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Sharleen O'Reilly

Sharleen O'Reilly (BSc, PhD, RD) is a CORU registered dietitian who works at the interface of research, teaching and practice in public health nutrition. Sharleen graduated from Trinity College Dublin with a degree in human nutrition and dietetics and her PhD. She worked as a dietitian in both Ireland and the UK before moving to Melbourne, Australia in 2004. Sharleen worked for Victoria University as a Lecturer before moving to Deakin University. She held a tenured Lecturing position before being promoted to Senior Lecturer in 2011. Sharleen's research led her to holding two prestigious Fellowships during her 12 years in Australia - the National Health and Medical Research Council's Translating Research into Practice Fellowship and an Australia Awards-Endeavour Executive Fellowship. Sharleen held Advanced Accredited Practising Dietitian (AdvAPD) status from 2014-2019, less than one percent of Australian dietitians hold this higher-level credential. She also holds teaching excellence awards from her time at Deakin University. Her current research interests lie in research translation and how chronic disease prevention and management can be better implemented in the real world. Her work is focused on taking what we know works in clinical research settings and developing implementable solutions to improve population health. She has attracted over 2.7M Euro research funding over the past 10 years. She is a member of the UCD Institute of Food and Health and the UCD Perinatal Research Centre. She is also a member of the academic staff for BSc Human Nutrition and MSc Clinical Nutrition and Dietetics. In addition, Sharleen is an Editorial Board member as well as Clinical Trials Editor for Nutrition and Dietetics and is Associate Editor for Diabetic Medicine. Sharleen holds an Adjunct Professor position at the Public Health Foundation of India and Adjunct Senior Clinical Lecturer at Deakin University.



Topic: Fixing feedback – The Case for Using Rubrics

- Rubrics are used for all assessments, both individual and group assessments.
- Student feedback can be as useful as staff feedback, and this appears to be cross cultural

Disclaimer:



- Feedback as a learning culture feedback is a two-way conversation between lecturer and students
- Time consuming so strategy and planning are critical
- This strategy is used on this module (FDSC40580 Research Project) within the online MSc in Food, Nutrition and Health, with students from across the world. Rubrics can help to foster connection in an online environment. The literature review component secures 40% and the project proposal 60% of the marks.
- In rubric development: start at the end, i.e. what do you want the students to be able to do, what skills do you want them to have acquired?
- Rubrics should be more focussed on the skills that students are developing as a result of the assessment than about structure. For example, thorough coverage of the relevant literature, critical analysis of the literature, logical development of rationale and significance of topic, communicating clearly and professionally using a scientific writing style and reflection on feedback. Feedback also needs to be signposted to students.
- Students can be very insightful in self- and peer-assessment if they feel that it will be of real value and will help them.
- A crucial element for success is not communication between lecturer and student but also between lecturer and tutor(s).
- Questions and Answers
 - For student peer feedback, lecturer should give students a template for what constitutes effective peer feedback and students should be placed into groups for this process. Each student receives peer review from three others in their group.

Celine Murrin

Celine graduated from University College Dublin with an honours degree in Biochemistry in 1996 followed by a Masters in Human Nutrition from the University if Ulster at Coleraine (1998). From there she took up a position as Food and Nutrition Researcher with the Consumers' Association of Ireland for over 2 years. She then worked in industry as an area manager for Nutricia Clinical Care for a further 2 years during which time she completed a Postgraduate Diploma in Health Promotion from the National University of Ireland, Galway (2003). In September 2003 she joined the National Nutrition Surveillance Centre in the School of Public Health and Population Science as the principal researcher which primarily involved analysis of diet and health data from the Survey of Lifestyle Attitudes and Nutrition (SLAN) and Lifeways datasets. In 2010 she completed a PhD in Public Health Nutrition



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examining maternal factors during pregnancy which contribute to early life risk of childhood obesity. Her research interest continues to focus on childhood obesity and the role of the family, early life nutrition, food behaviour, and the food environment during childhood. Following a twoyear teaching fellowship in UCD she was appointed as Lecturer in 2012.

Topic: Promoting Consumer Nutrition

- Concentration on effective communication of nutritional advice and information to consumers because, often, Masters students who can be considered experts in their fields, communicate from a top-down, "authoritarian, paternalistic" perspective, and this is rarely effective.
- The essence of the module is that it is the consumer who is at the very centre of any kind of communication strategy.
- Communication must consider what is the message content, who is sending the message, who is receiving the message, and how will the message be delivered?
- Learning outcomes focus on helping the student to understand the role of communication in helping health of consumers. Students must consider who their target audience is and what is the evidence base required to build an appropriate communication strategy. The assessment incorporates these learning outcomes.
- Assessment is online, on a group basis and is based on problem-based assessment. Specific target cohorts or groups are selected on the basis of increased susceptibility to nutritionally modifiable health conditions. Students must develop a communication strategy for such groups. Time management, resource allocation, planning are all key skills developed. Group Discussion Forum is established to facilitate this assignment.
- A virtual classroom is hosted during each semester. Students can log on with questions they have. Questions can ask questions via camera or there is a chat panel if students prefer.

James Lyng

1991-1995: PhD Agr, University College Dublin, 1995-1997: Research Officer, Teagasc Ashtown Food Research Centre, 1997-2002: Assistant Lecturer in Food Science, University College Dublin, 2002-2005: College Lecturer in Food Science, University College Dublin2005-2013: Senior Lecturer in Food Science, University College Dublin2014-Present: Professor in Food Science, University College Dublin.



Topics: 1) Use of Virtual Learning Environment (VLE) test features in selected modules in Food Science programmes

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- VLE test feature is used in Food Process Technology O/L (FDSC40540), Food Process Technology I (FDSC40030), Food Process Technology II (FDSC40040) and Food Physics Practicals (20%, BSEN 20060). There is a heavy emphasis on leveraging technology, e.g. YouTube videos are used extensively.
- Use of VLE can obviate problems due to resource constraints where, for example, higher student numbers may not be able to be accommodated due to shortages of expensive instruments and deficits of technical staff needed for certain practicals. Practicals are videoed and students must engage with the material by taking a 'low stakes' test, intended to be formative rather than summative.
- The proportion of modules that were assessed using VLE tools ranged from 20% to 100% (the latter in the O/L MSc in Food, Health & Nutrition). Assessments are formative and can be repeated multiple times to facilitate improvement.
- Options include question randomisation, time restriction and question weighting.
- Students were surveyed and asked their opinion of assessment. Fewer students tended to complete lower value, higher frequency assessments. Students, in general, do not find online assessment stressful. All final year undergraduates and Masters students felt that continuous assessments forced them to engage with the course material.

2) Six years' experience using REMOTE PROCTOR NOW for online monitoring

- Remote monitoring system for conduct of examinations by online students
- Students pay a fee per examination, (typically, US\$15 per 2-hour exam) thus the commercial relationship is confined to the remote proctoring service provider and the student. The lecturer is a registered user of the service.
- The lecturer registers as an administrator user and sets up an examination. The only way that a student can access the exam is with a username but the student never has a password. The required password is stored within the system.
- At login, the remote proctor system checks the student's computer by checking the camera, microphone and bandwidth to ensure that the examination can be completed. The remote proctor software then downloads into the student's computer. Then, the student has to accept the terms and conditions. The software monitors the student activity according to predefined rules and rule violations, e.g. not showing identification clearly, using a mobile phone, wearing headphones, and suspicious activity are logged.
- When remote proctoring began, there were many technical issues experienced, but significant learnings and experience were gained.
- Use of the remote proctor software during examination is cost neutral for the HEI.

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Amalia Scannell

Dr. Scannell is a Microbiologist / Food Technologist focussed on developing improved food safety and sensory performance in food through multi-disciplinary research. Her main interest is to ascertain the effects that changes in food products as brought about through novel processing, novel ingredients and new product development ideas have on both the microbial safety of food -using traditional microbiological and next generation sequencing techniques, and on consumer acceptance, consumer-led product development and sensory profiling. The innovation in her research is to generate big data describing how changes in novel processing parameters affect key product quality indicators, microbial inactivation and sensory characteristics. Together with other researchers in the UCD Institute of Food and Health, and in collaboration with other research institutions e.g. Teagasc, Technical University Dublin, and DCU she was involved in the optimisation of a number of novel processes and modelled key parameters in beverages and meat products in particular. The parameters that best inactivate populations of product specific microbes have also been determined. Dr. Scannell's vision is to determine how novel processing methods e.g. plasma technology, Acoustic technology, UV, LED light etc. affect microbes at a cellular/ gene expression level. By building detailed models to determine how changes in key processing parameters affect gene, information derived from this project will give clear direction to policy makers of the maximum and minimum processing levels to inactivate these microbes effectively. Dr Scannell has consistently applied for grant funding at national and international level and has successfully attracted awards from The Department of Agriculture. Food and the Marine,



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Enterprise Ireland, Science Foundation Ireland as well as some projects funded directly by Food Industry partners.

Since 2001, she have supervised 2 MSc students through research and 2 in the research component of a taught MSc in Food Science as well as one student from Open University. She has supervised or cosupervised 10 students to completion of their PhD and is currently mentoring two students who have recently begun their research programme. She also contributes to the UCD Online Taught Masters in Food and Nutrition.

Topic: [NOTE: this presentation took place on Tuesday afternoon following a re-schedule]

Flipped Classroom for Blended Learning

• Started with Fermented Foods, FDSC40010, 36 lectures delivery plus an assessment composed of a 5,000-word essay (30%) and a 2hour written exam (70%)

• Good students were not getting the grades that would have been expected

• Delivery and assessment changed to 24 lectures and assessment changed towards a Problem based learning group project (40%) and a 2hour written exam (60%). The impetus for this change was the weight and lectures and a putative case of 'too much information'.

• Amalia invested in further pedagogical courses – she had to decide what she wanted students to do and to be. The changes were towards students working in a team setting to identify individual and group learning issues. Students were tasked with sourcing, analysing and evaluating a published peer reviewed paper about fermented foods, to communicate findings to peers and to critically reflect on their own progress. They also had to keep a research log.

• She also changed from an essay format to a range of media to foster different students' different strengths.

- Students were also tasked with evaluating their own and their colleagues' performance.
- All these changes helped but grades were still not where they might have been expected.
- Why use a flipped classroom approach?

o Content is complicated. It covers ingredients, fermentation processes, processing equipment and steps and how manipulating all of these will affect product quality.

- The Flipped Classroom:
 - o Before the class the material/content is prepared
 - o In-class, the lecturer is a facilitator using scenario-based learning

ο	After class, 'check and extend' whether students have learned
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Disclaimer:



• How do we, as educators, know whether students have learned?

• The advantages include that the students have the material before they attend class, they work as a group, they chart their performance, they identify issues and bring them up at the next session for clarification and they get an opportunity to acquire time management skills.

- Students must engage from the beginning of the course and they must manage their time.
- Remembering and recall are not prioritised; understanding is the focus.
- Activities are designed to encourage and imbue higher level thinking.
- Current iteration is still 24 lectures.

• Students receive material online and then engage via a VLE Discussion Board where they post questions. Amalia speaks of 'pain points' where, if a student, does not understand something they can post it online in the VLE Board.

- In terms of assessment, how does she know that students are learning?
- There is a group quiz, colloquially called a 'pub quiz'.
- Concept understanding is developed by Mind map development.
- Feedback is not given as grades but as summative feedback.

• There is a project, where they can research a product of interest, or if they have a 'pain point' they can research this to enhance their understanding.

• There is a final exam, which is an open book. Students can bring anything except electronic devices or any form of prepared answer.

• Their own reflections are written as a research journal. It also provides evidence of their contribution as well as being of benefit for their reflection.

• Assessment is still by peer and self-assessment.

• Everything the students learn is assessed according to a rubric. These were worked on as part of the Institute of Food Technologists accreditation.

• This approach is not necessarily more expensive than traditional delivery and assessment.

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Study Visit Day Four

Thursday, September 19, 2019

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Thursday, 19 September 2019, 0900-1000

Activity: Essential transferable skills toolkit for Masters students

Objective: To demonstrate the importance of equipping students with the key transferable skills that industry look for in employees, and will highlight some examples of how this can be achieved.

Julie Dowsett talked about the importance of transferable skills in the job market. Employers seek graduates who have acquired these skills as a component of their studies. These were also identified as part of the WP1 Focus Groups in Asia as being of particular relevance and importance to the food industry. These transferable or 'soft' skills included but were not limited to problem solving, critical thinking, innovation, negotiation, time management, people management, decision making, influencing and leadership skills. A selection of the slides presented are shown below.

Transferable skills toolkit for the MSc student

Julie Dowsett MSc FINDI Dip Exec Coaching

- Leadership skills / decision making
- Self awareness/EQ
- Motivation/enthusiasm
- Competence work independently
- Organisational skills
- Good professional network



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- Learning agility / grow skills
- Creative / curious / problem solving
- Adaptable / flexible
- Take risks / likes a challenge
- Enthusiasm / drive / get involved
- Switch off time / life work balance



Overview of transferrable skills



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Managing self

- Self awareness DiSC profiling
- Planning and organizing
- Time management
- Values
- Resilience
- Communication skills
- Self management, self assessment SWOT goal setting SMART
- Career planning

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Managing others

- Giving and receiving feedback
- Negotiation
- Influence
- Team working
- Mentoring/coaching
- Having difficult conversations

DESIGN THINKING



Disclaimer:



Managing work

- Project management
- Presentation skills
- Professional networking
- Innovation
- Problem solving



Disclaimer:



	Leadership a	nd Management Skills
Logistics	F Media Skills	
LOBISTICS	Q Innovation a	nd impact
	Science writi	ng and presenting
Logistics	B DAY FACE TO FACE	PRE COURSE PRE COURSE WORK PRESENTATION PRESENTATION PUBLIC ENGAGEMENT
Logistics	 Leadership and Management Skills Media Skills Innovation and impact Science writing and presenting 	 3 day face to face 5 ECTS Pre course work Presentation Interview Newsletter Public engagement





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Thursday, 19 September 2019. Time: 10.00 – 13.00

Activity: Curriculum Structure and Coherent Learning Approaches

Objective: This workshop will focus on stage 5: The practicality of planning the FOODI MSc programme's structure and learning approaches. By the end of this workshop, using the agreed outcomes from the earlier session, a coherent and systematic approach to the teaching/learning and assessment strategies will be discussed.



This session focused on part 4 and part 5 of the Curriculum Development Wheel: aligning assessment and feedback strategies and elaborating the Curriculum structure and Coherent learning approaches. Emphasis was on a coherent and systematic approach to learning and assessment strategies. In this regard, the main concerns were the weighting of topics, i.e. which are 'major' and which are 'minor' (to help in developing core and elective courses, respectively), structure and sequence, and module/course size. Reference to the Curriculum Design triangle used by Fink (2003, see slide below) is instructive in this process. Below is a selection of the slides used in this session but also included are a series of images of the content developed by the participant groups. As part of the process, the Vision and Values and Programme Outcomes were considered.

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Objectives of the Session

Based on your work to date this week:

Discuss a coherent and systematic approach to the teaching, learning and assessment strategies, including i.e. the weighting of topics and the structure and sequence,

the module/course size

Coherence

In order to address the challenge of **coherence in curriculum organisation,** Ornstein and Hunkins note that attention should be given to the curriculum's:

- Scope,
- Sequence,
- Integration,
- Articulation and
- Balance

(Ornstein & Hunkins, 2009, p186-190; O'Neill, 2015. p48)

To achieve more coherent approach

•Reflect on the programme's vision and values

•Consider the students' needs (Do students see relevance of materials? Are they a more mixed group?);

•Sketch out the various designs (what are the relationships, good overlaps?);

•Cross check with aims/outcomes/learning experiences/evaluation;

•Share design with others

(Ornstein & Hunkins, 2009, O'Neill, 2015. p48)

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FOODI Vision and values

Purpose	Be able to demonstrate advanced knowledge and skills in the interdisciplinary field of food science and technology with strong technical capability to contribute in the transformation of the food industry, through creative, innovative and professional approach
Education and discipline values	The programme will expose students to core and elective courses which will enable them to critically analyze, synthesize, evaluate, interpret and communicate aspects of the food business sector in a professional and ethical manner to foster creativity and innovation and thereby enhance development and resolve challenges.
The nature of the learning environment for students	The learning will be transnational, diverse, adaptive, innovative blended learning environment using a variety of methodologies and tools including traditional classroom lectures, laboratory work, field trips, case studies and simulations, team-based learning and project work, self- directed and autonomous learning, workshops, seminars, professional industry internships as well as webinars, on-line tutorials and include the auspices of FOODI Centres of Excellence for vocations training courses and digital learning (MOOCs).
The key approaches to teaching, learning and assessment	Academia-industry collaboration, diverse learning, critical thinking, projects, presentation, design thinking and prototype development, teamwork, collaboration, discourse and debate, group-based project learning, assignment, mentorship, case studies aligned to regional challenges but with a national and international context.

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FOODI Programme Outcomes

- Integrate knowledge of food science/technology/entrepreneurship principles for transformation of the food industry to produce quality, safe, sustainable, healthy food
- Critically evaluate and apply innovative technologies for positive disruption and development of the food industry
- Conduct research and adhere to legal, ethical and professional practices in food innovation
- Demonstrate the ability to perform and effectively communicate original research in interdisciplinary areas of food science, technology and entrepreneurship
- Implement standard analytical and innovative methods including digital technologies, statistical software to monitor the risks and hazards influencing food quality.
- Demonstrate responsibility in planning, resource management, supervision, problem solving and managing work within a team and collaboratively with other teams.
- Analyse the main economic and strategic issues concerning food markets and consumer preferences, creating effective marketing plans for the food industry
- Plan or lead an entrepreneurial venture/ "start-up" or apply intrapreneurial intervention in the food domain.



Disclaimer:



Consider key themes/topics and their weighting

Scope: Common Tension (Knight, 2001)



Avoid the Race

There is a danger in trying to achieve a very wide scope in a curriculum that:

'as students <u>race through the topics</u> they have less opportunity to engage in the process of sorting, comparing, prioritizing and critiquing... ideas' (Clark and Linn, 2003).

'there should be opportunity for depth study; curricula should not be overcrowded' (Knight, 2001)



Disclaimer:



A Key Question

What does the teacher cover?



(O'Neill, 2015)







Exercise: Weighting of topics

Topics

In your tables, agree

- 5-6 Major Topics
- 4-5 'minor' Topics

Identify 3-4 Key

Skills

Students Skills

Based on Revised Programme Outcomes



Question to discuss:

To achieve the student skills, do they need to be taught the skill, experience it and/or have it assessed ?

(for example, do they need 'stand-alone' module(s) or embedded in some ?)

Disclaimer:



Structure: sequence and module size

Of critical importance is the structure and sequence of the modules/courses, not solely what the content is but when content is taught, as some content will be predicated upon other content having been covered previously. The breakdown of the Course Credits is also critical as there will be a defined number of credits for a MSc Programme (120 ECTS in the case of FOODI). Of crucial importance in this regard is the European Credit Transfer System (ECTS). Workload is an estimation of the time the individual (student) typically needs to complete all learning activities such as lectures, seminars, projects, practical work, work placements and individual study required to achieve a defined learning outcome in formal learning environments. The correspondence of the full-time workload of an academic year to 60 credits is often formalised by national legal provisions. In most cases, workload ranges from 1,500 to 1,800 hours for an academic year, which means that **one credit corresponds to 25 to 30 hours of work.** Specific architectures were presented as guidelines which participants could follow in their efforts (within the 5 groups originally assigned above) to structure the FOODI MSc Programme.

The five structures proposed by the five groups are presented below (Figure 10), as the hand written structures that were developed by each group. All groups were asked to vote on which of the structures they considered the best, in line with the Vision & Values, Programmes Outcomes and the major and minor topics that were decided upon. Participants were also asked to decide upon whom the target audience should be and what the desirable skills should be, as outlined above.

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Rough Structure (90 ECT Credits)

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Deliverable 2.2 Study Visit to UCD, Dublin

The above slides depict possible structures that could be considered by study visit participants for the programme architecture. Crucially, the total ECTS needs to be considered at all stages. A balance should be struck between course depth and the number of courses.

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Exercise: Present A Visual Overview of your design

1. Present a visual overview of the 3 sesmesters:

your planned modules' size and topics and/or skills that you emphasized

- 2. Use arrows, links, text, comments:
 - to note the skills, teaching approaches, to be developed
 - or to note some options (choices of topics)



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After each group had designed their Curriculum, all groups voted on which they thought was the most appropriate, bearing in mind FOODI Vision & Values, Programmes Outcomes, Target audience and desirable skills. Each individual had a vote, voting for a first choice and a second choice. A first choice was indicated by sticking a gold star (2 points) on the drawn Curriculum structure, while a second choice was indicated by sticking a green star on the next best as judged by each individual. At the end of the voting process, gold stars and green stars stuck on each Curriculum were counted and a score generated for each Curriculum (Table 3).

On this basis, the Curriculum designed by Group 3 was chosen as the most appropriate to fulfil the FOODI requirements.

This structure was elaborated on Friday, the final day of the visit.

Feedback was also included by individuals placed Post-It[®] sticky notes on the Curriculum that they selected, indicated why they chose (voted for) it (yellow notes) and how it could be improved (blue notes) (please see Figure 11 photos, below).

Group	Gold stars (2 pts)	Green stars (1 point)	Total Points	Rank
1	6	3	15	4
2	10	1	21	2
3	12	5	29	1
4	8	2	18	3
5	3	5	11	5

Table 4. The votes for each Curriculum structure

On this basis, the Curriculum structure developed by Group 3 was chosen.

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BOX 6. TARGET AUDIENCE.

A wide approach. If not from a science background then a conditional core course must be a pre-requisite.

- Professionals in the food industry
- Upskilling
- Career changers
- Graduates from science disciplines
- Graduates from engineering or business disciplines (conditional)

BOX 7. DESIRABLE SKILLS

- Critical thinking
- Communication
- Creativity
- Adaptability
- Attitude/ Willingness to learn
- Teamwork
- Decision Making/good judgement
- Negotiation

- All
MAJOR
ONDVEL FOOD PROCESSING
(2) New Product Development (Consumer
3 FOOD SAFETY + QUALITY ASSURANCE (HALAL)
(4) TOOD LAW + REGULATION OMARKETING + SUPPLY CHAIN MANAGEMENT (CANNUM)
OPESCARCH METHODS? PROJECT ENDER
Officient i
Tertion
portrain
- D PERFESSING + PROSERVATION
CORE COURSES FOOD MULE RESOURCE
Dr self-cluters

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Disclaim Eigure 11. Major and minor topics to be included in course content of the FOODI MSc With the **program me** the Erasmus+ Programme of the European Union. This document reflects only the view of its author; the EACEA and the European Commission are not responsible for any use that may be made of the information it contains.



(a)



Disclaimer:



(b)



Disclaimer:



(c)

Research 18 Entrepreneur Ship ospar DOO nganess ood nnovation & Salec stratigy 101 ood Industry leds no essina \$ Oa On liral Components oods Food Product Innocation rition

Disclaimer:



(d)

(e)





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Figure 12. Curriculum structures proposed by each group: (a) Group 1; (b) Group 2; (c) Group 3; (d) Group 4; (e) Group 5.

Study Visit Day Five

Friday, September 20, 2019

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Deliverable 2.2 Study Visit to UCD, Dublin



A general discussion was held on Friday morning surrounding the Curriculum that had been developed on Thursday. Although the general layout and indicative programme had been drafted on Thursday there was much discussion regarding course content, and in particular what courses would be 'core' and which would be 'elective'. What followed on Friday morning was a very iterative but also interactive process of engagement with the proposed FOODI Programme.

A list of potential elective courses was decided upon. It was decided that the 'Project' component would constitute one-third of total credits (30 ECTS). There was general agreement that the research should relate to practical industrial or real-world problems but that it should be done in a manner that is similar to an academic thesis, although not being called a 'thesis'.

There also some discussion about how the 30 'Project' ECTS would be sub-divided between the thesis, report and internship. This was a very iterative process. The question was asked as to whether students could take modules/courses while doing the internship and the participants response was an emphatic 'no'. A comment was made that the 30 ECTS component needed to include design thinking and creativity due to the innovation ethos infusing the FOODI MSc Programme.

That there would be 3 semesters was decided. Semesters in South East Asian HEIs are generally 14 weeks. In Cambodia, 3 semesters would last for 45 weeks. The Project Component would acquire increased significance as the Programme progressed and would constitute the bulk of the student workload in semester 3, but there would be project or project-related workload in both semester one and semester two.

The credit weighting of each course was queried as to whether having 5 or 6 credit courses was most appropriate and that each HEI may find a given course more or less relevant to their context. There has also been some discussion about this issue on both Tuesday (Aideen McKevitt) and Thursday (Geraldine O'Neill). It was acknowledged that it would be difficult and probably unworkable to have different course weightings in different countries so there would have to be general agreement across countries. Striking a balance between covering enough core topics but also doing so, in each case, to sufficient depth and granularity, was the challenge.

The questions were raised as to whether assessment could include milestones or phases and it was commented that such a system already operates in Malaysia.

The FOODI Programme was outlined on a whiteboard. All of the potential core and elective courses were written on separate detachable paper cut-outs and these were attached to the whiteboard but subsequently moved around by participants as engagement ensued, until a tentative final structure for the FOODI Programme was arrived at. This is illustrated in Figure 11 (below). From this template, a stylised FOODI Programme structure was finalised as the chief UCD study visit output (Figure 12) (below).

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Figure 13. FOODI MSc Programme Structure.

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Figure 14. FOODI MSc Programme structure outlined in Microsoft Powerpoint.

Additionally, Asian HEI study visit participants selected the courses that they would take responsibility for developing. After the study visit, European HEIs were co-assigned responsibility for courses in areas where their expertise would contribute. These responsibilities are illustrated in Figure 13.

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Figure 15. FOODI Programme structure with HEI course assignment indicated.

Target audiences for the uptake of FOODI MSc Programme and the desirable skills that they should possess were also decided upon. List of major and minor topics that should be included and how these should be sequenced and structured were decided on the penultimate day of the visit, with some discussion, iteration and refinement on the final day in advance of the FOODI Steering Committee meeting. It was decided by general agreement that the FOODI MSc Programme would have only one stream rather than two and that it would contain 90 credits with a core allocation of 72 credits and an elective allocation of 18 credits. Core courses included Research and Investigative Processes, Food Quality, Micro-and Macronutrient Analysis, Food Process Design, Processing Effects on Structural and Functional Components of Foods, Entrepreneurship and Business Strategy, Food Safety, Law and Regulation and Food Supply Chain, Traceability and Sustainability. A Project component of 30 credits was decided upon although significant discussion occurred at the practical aspects of how this would work. The Project component was subdivided into three areas – a course on Creativity, Design Thinking and Innovation, an Internship or Industry-based work project and a report, written in thesis format, but not formally recognised as a thesis. Significant discussion occurred about how this component would operate and how the sub components would be weighted and sequenced and further discussion was required after the study visit to arrive at tentative agreements. There were also a series of elective courses which included Food Packaging, Halal Regulation, Food Sales and Marketing, Nutrition and Health, Hot Topics/Global Issues and Consumer Behaviour. Students would need to complete 3 of the elective modules to complete 18 credits of electives courses. Crucially, since the target audience

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included up-skillers and career changers, there was a conditional course in Introductory Food Science, bearing no credits.

No discussion or decision regarding the Vocational & Educational Training (VET) components were taken in Dublin but these were to be discussed in Salerno at the UNISA study visit.

The assignment of Asian HEIs (based on their own selection) to FOODI MSc courses is also detailed in Table 4 (below).

Table 5. List of courses to be developed under the FOODI MSc Programme, their credit weightings and the HEIs and academics who are responsible for the development.

FOODI course code (tentative)	Course	# credits	Lead Asian partner	Lead Academic	Associated Asian Partners	Supporting European Partner
FOODI Pre-req	Food Science & Technology	no credit bearing	UITM	Prof Margaret Chan Kit Yok	PSU	UCD
FOODI Core 1	Research & Investigative Processes	6	UM	Prof Dr Ramesh T Subramanian	UHST	UNISA
FOODI Core 2	Food Quality, Micro and Marco Analysis & Sensory Science	6	PSU	Prof Kongkarn Kijroongrojana	UniKL	UCD
FOODI Core 3	Food Process Design	6	AIT	Dr Anil Kumar Anal		UNISA
FOODI Core 4	Processing Effects on Structural & Functional Components of Foods	6	PSU	Prof Kongkarn Kijroongrojana	AIT	UNISA
FOODI Core 5	Entrepreneurship & Business Strategy	6	UTM	Prof Rosmini Omar		UAegean
FOODI Core 6	Food Safety, Law & Regulation	6	ITC	Dr Hasika Mith	AIT, PSU	UCD
FOODI Core 7	Food Supply Chain, Traceability & Sustainability	6	AIT	Dr Anil Kumar Anal		UNISA
FOODI Core 8-a	Thesis/Report	TBC	UITM	Prof Margaret Chan Kit Yok		UCD/UAegean
FOODI Core 8-b	Internship/Industry Based Project Work Experience	TBC	UITM	Prof Margaret Chan Kit Yok		UCD/UAegean
FOODI Core 8-c	Creativity, Design Thinking & Innovation	TBC	UTM	Prof Rosmini Omar		UCD/UAegean
FOODI Elective 1	Food Packaging	6	UTM	Prof Rosmini Omar		UNISA
FOODI Elective 2	Halal Regulation & Certification	6	UiniKL	Dr Noriza Ahmad	UITM, PSU	UNISA
FOODI Elective 3	Food Sales & Marketing	6	UTM	Prof Rosmini Omar	UBB, SRU	UAegean
FOODI Elective 4	Nutrition & Health	6	ITC	Dr Hasika Mith		UCD
FOODI Elective 5	Hot Topics / Global Issues	6	UBB	Dr Rany Sam	UHST	UAegean
FOODI Elective 6	Consumer Behaviour	6	SRU	Dr Serey Mardy	UBB	UAegean

AGGREGATE OUTCOMES AND AGREED ACTIONS

Aggregate Outcomes

- Vision and Values Statement agreed
- Programme Outcomes agreed
- Target audience agreed
- Desirable skills agreed
- FOODI MSc Programme structure and schedule agreed
- Responsibility for course development assigned to Asian HEIs and co-responsibility assigned to European HEIs.

Agreed Actions

- Further discussion and refinement of course content in UNISA, 11-15 November 2019
- Discussion on VETs in UNISA
- Information on each National Framework of Qualifications and FOODI MSc Programme Accreditation

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Next Steps: Study Visit to UNISA, November 11-15, 2019 Agenda for the Study Visit to UNISA

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Deliverable 2.2 Study Visit to UCD, Dublin

FOODIAgenda for the Salerno			Co-funded Erasmus+ Progra of the European	foodi сказмизе сене	
	11/11 MONDAY	12/11 TUESDAY	13/11 WEDNE SDAY	14/11 THURSDAY	15/11 FRIDAY
9:30	welcome and presentation to the week	Active learning - M. Barolo (UNIPD)	Groups on courses	VET Learning Outcomes	Tasks on staff training material preparation
10:00	Study program quality @ UNISA - M. Poletto	Active learning - M. Barolo (UNIPD)	Groups on courses	VET Learning Outcomes	Tasks on staff training material preparation
10:30	Study program quality @ UNISA - M. Poletto	Active learning - M. Barolo (UNIPD)	Wrap up on courses	VET Learning Outcomes	Tasks on staff training material preparation
11:00	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:30	ASIFOOD experience - Anil Kumar (AIT)	Groups on courses	Plenary on thesis/report/internship	VET Structure	Steering committee
12:00	SIMPLE experience - Koemsang Nhuong (UBB)	Groups on courses	Plenary on thesis/report/internship	VET Structure	Steering committee
12:30	Discussion	Groups on courses	Plenary on thesis/report/internship	VET Structure	Steering committee
13:00	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break
13:3 <mark>0</mark>	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break
14:00	Catch-up from Dublin	Groups on courses	VET Program	VLE overview	
14:30	Final set-up of the program	Groups on courses	VET Program	VLE overview	
15:00	Final set-up of the program	Groups on courses	VET Program	VLE overview	
15:30	Coffee break	Coffee break	Coffee break	Coffee break	
16:00	Final set-up of the program	Groups on courses	Visit to laboratories	Visit to laboratories	
16:30	Final set-up of the program	Groups on courses	Visit to laboratories	Visit to laboratories	
17:00	Organization of workgroups on courses	Groups on courses	Visit to laboratories	Visit to laboratories	



APPENDIX ONE.

Sample Evaluation Sheet

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Study Visit Evaluation Form

Project name/acronym	MSc Food F	Processing	ocessing & Innovation/FOODI				
Project number	598987-ЕРР-1-2018-1-МҮ-ЕРРКА2-СВНЕ-ЈР						
Meeting Name	Study Visit						
Date	16 th to 20 th September 2019						
Place	Dublin, Ireland						
Hosting Organisation	University College Dublin						
Evaluation Form submitted by	valuation Form submitted by Cambodia						
Name of Institution	Ui ig Samrin Thbongkhmum (UHST)						
Date of submission	Date of submission 26						
Thank you for your participation in the Study Visit.							
Г	The aims of the visit were to						
1) to demonstrate element	1) to demonstrate elements of UCD's programmes in particular their online MSc						
Food, Nutrition & Health and	d to discus	ss their	transfei	ability to	the proposed FOODI		
programme							
is	appropri	ate to th	neir nee	eds.			
Project Meeting/Event Quality Criteria							
How satisfied are you:	Completely satisfied	Satisfied	Neutral	Dissatisfied	Completely dissatisfied		
with the preparations made to organize the meeting?							
with the venue arrangements?	\boxtimes						
With support (meeting rooms, equipment) provided during the meeting?							
with the participation of project partners in discussions and decision making?							

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How satisfied are you:	Completely satisfied	Satisfied	Neutral	Dissatisfied	Completely dissatisfied
with the structure of the agenda (subjects/issues covered)?	\boxtimes				
with the time assigned to the discussion of important issues?	\boxtimes				
with the scope of information presented?		\boxtimes			
with the meeting's overall value in helping you achieve project goals?	\boxtimes				
with the quality of the overall meeting	\boxtimes				

What were the strengths of this meeting?

The trainers are good, discussion participants had excellent comment. Mapping potential teaching, learning and assessment /feedback methods. Essential transferable skills toolkit for Master students. Curriculum structure and coherent learning approaches. Aligning programme outcomes to potential assessment and feedback strategies.

What were the weaknesses of this meeting?

This meeting were the weaknesses such as: Lunch

Ideas for improving project meeting?

My ideas for improving project meeting is important for master program in Cambodia major food processing and innovation such as Mapping potential teaching, learning and assessment /feedback methods. Essential transferable skills toolkit for Master students. Curriculum structure and coherent learning approaches. Aligning programme outcomes to potential assessment and feedback strategies.

Other comments

Lunch should be some foods such as Asian foods and European foods.

Thank you and we wish you a safe journey home.

Slán Abhaile!

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APPENDIX TWO. Aggregate Study Visit Evaluation data

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	Number of respondents						
How satisfed were you:	Completely satisfied	Satisfied	Neutral	Dissatisfied	Completely dissatisfied		
with the preparations made to organise the meeting?	25	3	0	0	0		
with the venue arangements?	26	2	0	0	0		
with support (meeting rooms, equipment) provided during the meeting?	26	2	0	0	0		
with the participation of project partners in discussions and decision making?	14	14	0	0	0		
with the structure of the agenda?	18	10	0	0	0		
with the time assigned to the discussion of important issues?	19	9	0	0	0		
with the scope of information presented?	17	11	0	0	0		
with the meetings overall value in helping you achieve project goals?	19	9	0	0	0		
with the quality of the overall meeting?	22	6	0	0	0		
	Percentage of respo	ndents					
How satisfed were you:	Completely satisfied	Satisfied	Neutral	Dissatisfied	Completely dissatisfied		
with the preparations made to organise the meeting?	89	11	0	0	0		
with the venue arangements?	92	8	0	0	0		
with support (meeting rooms, equipment) provided during the meeting?	92	8	0	0	0		
with the participation of project partners in discussions and decision making?	50	50	0	0	0		
			0	0	0		
with the structure of the agenda?	64	36	0	0	0		
with the time assigned to the discussion of important issues?	68	32	0	0	0		
with the scope of information presented?	61	39	0	0	0		
with the meetings overall value in helping you achieve project goals?	68	32	0	0	0		
with the quality of the overall meeting?	79	21	0	0	0		

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