Education with Sustainability – What have I learned?

Associate Professor Tom Curran, UCD School of Biosystems & Food Engineering

Vice Principal for Internationalisation, College of Engineering & Architecture, University College Dublin

Email: tom.curran@ucd.ie

Keynote Talk at 3rd International Education with Sustainability Conference hosted by ATU Sligo and Mid Sweden University, 17 August 2022.
Overview

• Education
• Industry
• Teaching
• Research
• Communication
• Conclusions and Future Developments
Education

• Engineering degree
• I-shaped v T-shaped
• Sustainability
• Communication
• International work experience – UK, Austria
Industry

• 2 companies
• Small (family owned) and large (plc)
• Profit v Sustainability
• EPA and local authorities
• New onus on companies now
Teaching

• Internationalisation
  • Increasing number of international students
  • Students concerned about sustainability
• International project sharing student videos in 5 universities for peer assessment: UCD, VT, UIUC, UPM, Bari

• Modules
  • Waste Management
  • Air Pollution
  • Farm Buildings
  • Biosystems Engineering Design Challenge
Design Challenge - Problem-based learning with groups using recycled materials
Research
AgroCycle H2020 Project

• Led by the School of Biosystems & Food Engineering, University College Dublin
• 3-year project (2016-19), 26 partners: Europe and China
• €7 million from EC plus ca. €1 million from Government of the People’s Republic of China
• **8 European Countries**
  
  o Ireland
  
  o Spain
  
  o United Kingdom
  
  o Germany
  
  o Belgium
  
  o Italy
  
  o Greece
  
  o Croatia
  
• China
This project has received funding from the European Union’s Horizon 2020 Research and Innovation programme under grant agreement No. 690142 in collaboration with the People’s Republic of China and the Hong Kong Government.
AgroCycle Objective

• To deliver sustainable waste valorisation
• Address European policy target of reducing food waste - 50% by 2030
• Contribute to the change occurring in China in relation to sustainability
AgroCycle Approach

• A full systems approach

• Developing a ‘Circular Economy’ around the agri-food chain:
  • Pre- and post-farm gate
  • Food and agri-products processing sector
  • Wholesale and retail
  • Waste processing – valorisation incl. bio-fuels, high value-added biopolymers, energy & micro fuel cells.
  • Consumer
AgroCycle Kids

Delivered AgroCycle Kids Bespoke Curriculum in Ireland.

**Free** resources available through AgroCycle Kids for teachers, guardians, children:

- Lesson Plans (won international bioeconomy award)
- Science and Environmental Animation
- Online Games
- Rap song and animated video on AgroCycle YouTube Channel

Aspects of the overall AgroCycle Kids programme delivered to Chinese primary school children in The Affiliated Primary School of Beijing Forestry University.
AgroCycle Kids Video

Developed with media company

Refined communication message

Animated Video plus Rap - has been viewed >1.5k times on YouTube
Horizon Europe Project - EDUCATION FOR THE BIOECONOMY

- Funded by Horizon Europe CALL: HORIZON-CL6-2021-GOVERNANCE-01-11
- Topic: Education on the bioeconomy including bio-based sectors for young people in primary and secondary education in Europe
- Project Type: Coordination and Support Action (CSA)
- Coordinated by UCD School of Biosystems and Food Engineering
- 15 partners across 10 countries including Maynooth University and An Taisce
- Budget: ca. €2 million over 2 years (2022-2024)
BioBeo Overall Aim:
To develop and deploy an education programme to enhance understanding and engagement across society regarding lifestyle, circularity and bioeconomy, using 5 bioeconomy themes: interconnectedness, outdoor learning, forestry, life below water and the food loop.

BioBeo will contribute to the transition to a sustainable EU circular bioeconomy by enhancing society-wide awareness and inspiring Europe’s youth to pursue STEM related careers.
<table>
<thead>
<tr>
<th>Participant No.</th>
<th>BioBeo Participant organisation name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UCD - Lead University College Dublin</td>
<td>Ireland</td>
</tr>
<tr>
<td>2</td>
<td>MU Maynooth University</td>
<td>Ireland</td>
</tr>
<tr>
<td>3</td>
<td>AnT An Taisce</td>
<td>Ireland</td>
</tr>
<tr>
<td>4</td>
<td>UH University of Hohenheim</td>
<td>Germany</td>
</tr>
<tr>
<td>5</td>
<td>OUAS Odisee University of Applied Sciences</td>
<td>Belgium</td>
</tr>
<tr>
<td>6</td>
<td>CASE Centre for Social and Economic Research</td>
<td>Poland</td>
</tr>
<tr>
<td>7</td>
<td>RUAS Rotterdam University of Applied Sciences</td>
<td>Netherlands</td>
</tr>
<tr>
<td>8</td>
<td>SYNYO Synyo</td>
<td>Austria</td>
</tr>
<tr>
<td>9</td>
<td>FEE Foundation for Environmental Education</td>
<td>UK</td>
</tr>
<tr>
<td>10</td>
<td>YSBF Youth in Science and Business Foundation</td>
<td>Estonia</td>
</tr>
<tr>
<td>11</td>
<td>E3STEM E3STEM</td>
<td>Greece</td>
</tr>
<tr>
<td>12</td>
<td>IPA International Parents Alliance</td>
<td>Netherlands</td>
</tr>
<tr>
<td>13</td>
<td>UVT Universitatea Valahia Targoviste</td>
<td>Romania</td>
</tr>
<tr>
<td>14</td>
<td>TUB Technical University Berlin</td>
<td>Germany</td>
</tr>
<tr>
<td>15</td>
<td>BOS+ BOS+</td>
<td>Belgium</td>
</tr>
</tbody>
</table>
Increased awareness of the environmental, social and economic benefits

Young generation inspired to pursue careers in bioeconomy

New generations joining education and training

Innovative digital toolkits launched

Teachers, parents and pupils engaged in co-creation of new education courses and materials
Communication

• Media interviews about fatbergs
• Standup Comedy in Bright Club
  • YouTube – ‘Dr Fatberg and the 3 Ps’
• Comics
  • ‘Attack of the Fatbergs’ & ‘Return of the Fatbergs’
    • [www.swiftcomply.com/attack-of-the-fatbergs](http://www.swiftcomply.com/attack-of-the-fatbergs)
  • ‘There’s Something About Ammonia’
    • Download free from UCD Research Repository
Conclusions and Future Developments

• National and international policy
• Academic leaders
• Internationalisation
• Professions, e.g.,
  • Engineers Ireland Sustainability Framework
• Not-for-profit organisations, e.g.,
  • Environmental Sciences Association of Ireland (ESAI)
  • Climate Action Network for International Educators (CANIE)
• Lifelong learning across society