BLOCK CHAIN FOR AGRI FOOD EDU

Teacher's Guide to

Blockchain for Agri Food Edu Curriculum & Open Education Resources

Welcome tour Teacher's Guide

Blockchain for Agri Edu

Curriculum & Open Education Resources

"Efficiently run food supply chains can positively impact communities and lives across the globe. Real-time tracking supports sustainability, prevents food waste, and ensures compliance with environmental, social and governance (ESG) standards. Communication throughout the supply chain can help producers earn fair compensation for their efforts. Ultimately, being able to track food from source to stomach improves the health and wellness of communities everywhere."

WORLD ECONOMIC FORUM

AUGUST 2024

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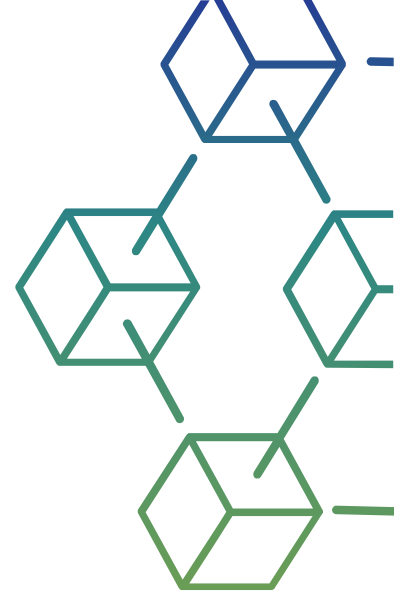
BLOCK CHAIN FOR AGRI FOOD EDU

BLOCKCHAIN FOR AGRI FOOD EDU

01

Welcome/foreword

Foreword

Blockchain for Agri-Food Educators is an innovative project that seeks to transform the provision of education in the agribusiness, food science, and nutrition sectors through the strategic utilization of blockchain technology.

By developing innovative pedagogical approaches that encompass a wide range of theories, methods, processes, and teaching concepts, we are enabling higher education educators to take the lead in digitising the food sector while simultaneously addressing critical societal challenges within the food supply chain.

Agrifood supply chains are complex and involve many actors — from small-scale farmers, primary processors, and traders to product manufacturers, distributors, retailers, and consumers. Emerging blockchain technologies, which improve transparency, security, and durability of supply chains, show promise for addressing the current limitations of food supply chain management:

CONTEXT AND THE OPPORTUNITY
Over 71% of consumers worldwide are willing to pay a premium for brands that provide transparent information.

Food wastage reduction is another noteworthy benefit of blockchain. According to the Food and Agriculture Organization of the United Nations, "Roughly one-third of the food produced in the world for human consumption every year - approximately 1.3 billion tonnes - gets lost or wasted".

Guidelines on Teaching Blockchain

Introducing the Guideline for Teaching Blockchain to Agrifood students, a research-based guide designed to revolutionise blockchain education in the agri-food sector. Funded by Erasmus+, this guide offers practical recommendations and pedagogical strategies to enhance your teaching methods and ensure students grasp the complexities of blockchain technology.

What it included in the Guidelines:

Teaching Methods
The guide explores various teaching methods, including traditional didactic approaches and innovative interactive sessions. It emphasises the importance of adapting strategies to meet diverse learning styles, ensuring every student can effectively understand blockchain concepts.

Key Pedagogical Strategies
Key pedagogical strategies include Backwards Design, where educators start by defining learning objectives and then select active learning approaches aligned with those goals. This ensures that each task and piece of instruction serves a purpose and aligns with the overarching goals of the course.

Types of Lectures
The guide also delves into different types of lectures, such as blended courses that combine face-to-face and online content. This flexible approach addresses diverse learning needs and can lead to lower dropout rates compared to fully online or in-person courses.

Active Learning Methods
Active learning methods are highlighted, such as the Whimbey-Lochhead Pair Method, which enhances problem-solving skills by having students verbalise their thought processes. The Feedback Lecture involves peer-to-peer teaching and mid-lecture group activities, fostering a cooperative class environment and motivating students to prepare for each class.

Practical Tools
In addition to lectures, the guide includes practical tools like concept maps, which help students visually organise and retain information. Techniques like Bloom's Taxonomy are used to plan and deliver appropriate instruction, design valid assessment tasks, and ensure alignment with learning objectives.

Collaborative Learning Methods
The guide further explores team-based learning, peer-led team learning, and problem-based learning. These methods encourage collaboration, critical thinking, and real-world problem-solving, making learning more engaging and effective.
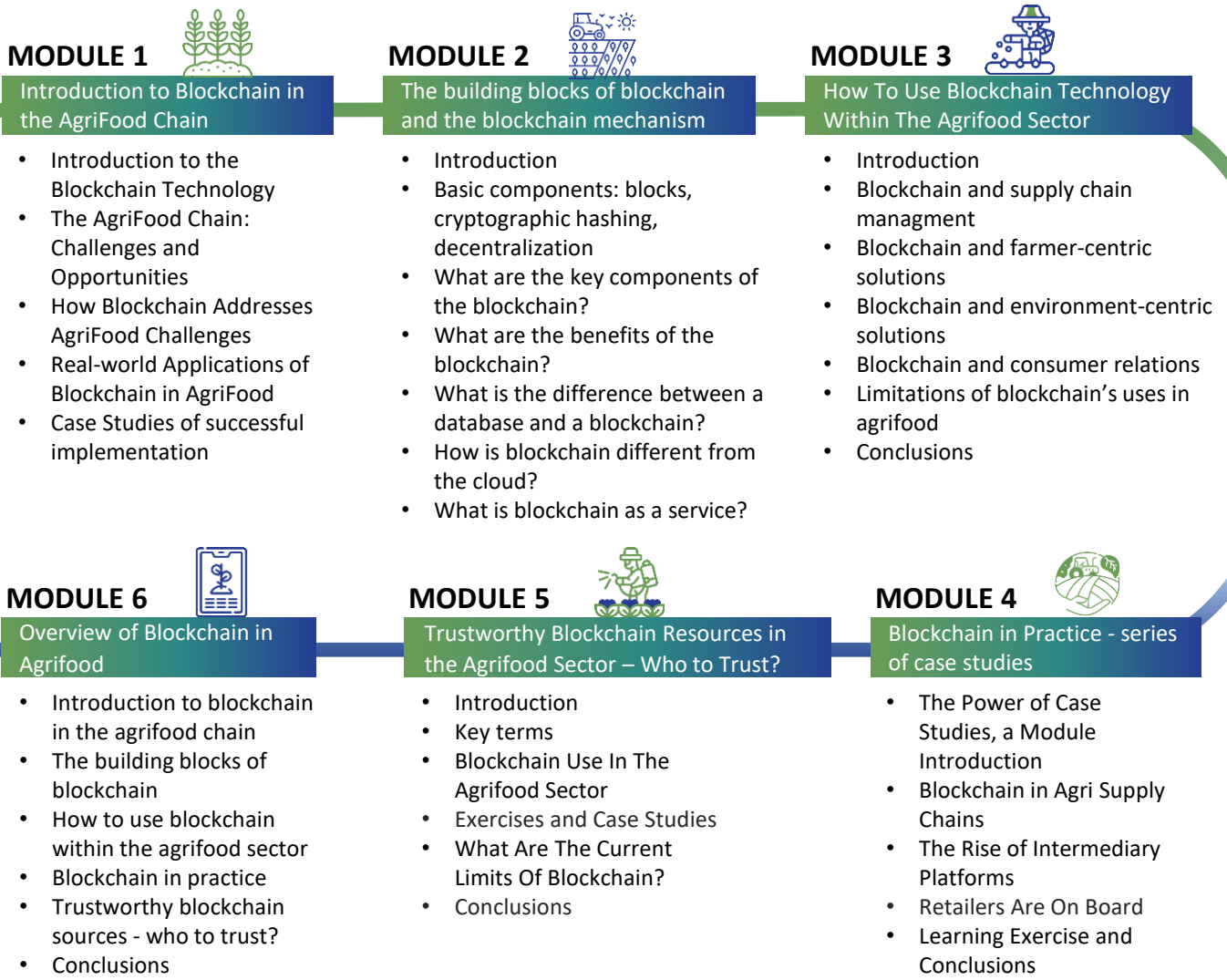
02

Curriculum & Modules

Course Content Overview

a) Modules

The Curriculum comprises six modules structured
as a journey…

MODULE 1
Introduction to Blockchain in the AgriFood Chain

- Introduction to the Blockchain Technology
- The AgriFood Chain: Challenges and Opportunities
- How Blockchain Addresses AgriFood Challenges
- Real-world Applications of Blockchain in AgriFood
- Case Studies of successful implementation

MODULE 2
The building blocks of blockchain and the blockchain mechanism

- Introduction
- Basic components: blocks, cryptographic hashing, decentralization
- What are the key components of the blockchain?
- What are the benefits of the blockchain?
- What is the difference between a database and a blockchain?
- How is blockchain different from the cloud?
- What is blockchain as a service?

MODULE 3
How To Use Blockchain Technology Within The Agrifood Sector

- Introduction
- Blockchain and supply chain managment
- Blockchain and farmer-centric solutions
- Blockchain and environment-centric solutions
- Blockchain and consumer relations
- Limitations of blockchain's uses in agrifood
- Conclusions

MODULE 6
Overview of Blockchain in Agrifood

- Introduction to blockchain in the agrifood chain
- The building blocks of blockchain
- How to use blockchain within the agrifood sector
- Blockchain in practice
- Trustworthy blockchain sources - who to trust?
- Conclusions

MODULE 5
Trustworthy Blockchain Resources in the Agrifood Sector – Who to Trust?

- Introduction
- Key terms
- Blockchain Use In The Agrifood Sector
- Exercises and Case Studies
- What Are The Current Limits Of Blockchain?
- Conclusions

MODULE 4
Blockchain in Practice - series of case studies

- The Power of Case Studies, a Module Introduction
- Blockchain in Agri Supply Chains
- The Rise of Intermediary Platforms
- Retailers Are On Board
- Learning Exercise and Conclusions

- Module 1: Introduction to Blockchain in the AgriFood Chain
- Module 2: The building blocks of blockchain and the blockchain mechanism
- Module 3: How To Use Blockchain Technology Within The Agrifood Sector
- Module 4: Blockchain in Practice - series of case studies
- Module 5: Trustworthy Blockchain Resources in the Agrifood Sector – Who to Trust?
- Module 6: Overview of Blockchain in Agrifood
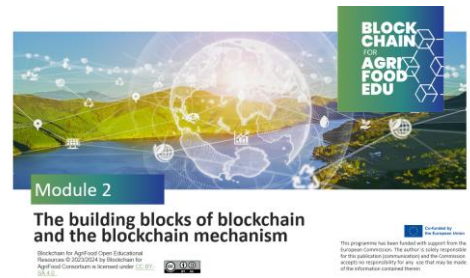
Course Content Overview (continued)
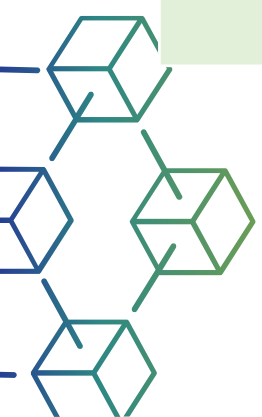
b) Course content detailed overview

MODULE 1	Introduction to Blockchain in the AgriFood Chain
Overview	This module includes the introduction to the blockchain technology, challenges and opportunities that blockchain can open in agrifood sector and how these agrifood challenges can addresses. There are also included an examples of real-world Applications of Blockchain in AgriFood. The main benefit of the module focuses on the presentation of potential barriers and considerations.
Learning Objectives	To provide students with a foundational understanding of blockchain technology and its applications within the agrifood sector. Through the module, learners will engage with various educational materials and activities to develop theoretical knowledge on the topic. This knowledge will be reinforced through a case study, an interactive activity, and a quiz. By the end of the module, participants will have a practical and theoretical understanding of how blockchain can impact agrifood systems.
Topics Covered	• Introduction to the Blockchain Technology • The AgriFood Chain: Challenges and Opportunities • How Blockchain Addresses AgriFood Challenges • Real-world Applications of Blockchain in AgriFood • Case Studies of successful implementation
Case Studies	• Singapore Exchange Limited • Sony Music Entertainment Japan • Amazon retail • AgriDigital
Further Reading	• What is the blockchain and whats it used for • Importance of data standardization and harmonization in agriculture • Science Soft Blockchain in Food Supply Chain • Agridigital • Why do we need blockchain in agriculture? • Blockchain in agriculture - Explained • Agriculture Supply Chain Management Based on Blockchain Architecture and Smart Contracts • Survey on the Applications of Blockchain in Agriculture • A Systematic Review of Blockchain Technology Adoption Barriers and Enablers for Smart and Sustainable Agriculture

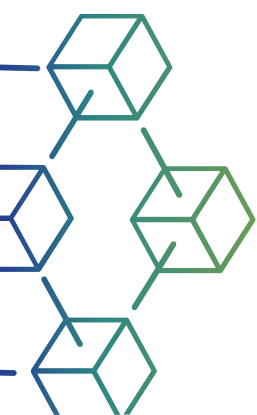# Course Content Overview (continued)

Module 2
The building blocks of blockchain and the blockchain mechanism

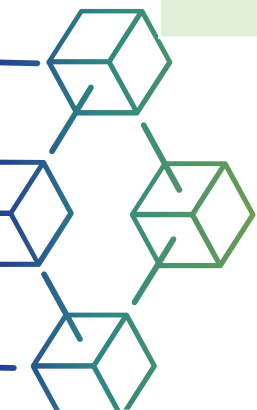| MODULE 2	The building blocks of blockchain and the blockchain mechanism
Overview	This module includes includes the principles of blockchain creation (what is a block and what is a chain), the basic features of the traditional, decentralised and distributed concept of the databases and the properties and requirements of cryptography and hash functions and has as result. There are also included an explanation of the difference between proof of work and proof of state and the main benefits of blockchain in the module.
Learning Objectives	Learners will acquire basic theoretical knowledge in the field of blockchain creation and requirements for cryptographic and hashing functions. Through the module, learners will engage with various educational materials and activities to develop theoretical knowledge on the topic. This knowledge will be reinforced through a case study, an interactive activity, and a quiz. By the end of the module, participants will have a practical and theoretical understanding of how blockchain can impact agrifood systems.
Topics Covered	• Introduction • Basic components: blocks, cryptographic hashing, decentralization • What are the key components of the blockchain? • What are the benefits of the blockchain? • What is the difference between a database and a blockchain? • How is blockchain different from the cloud? • What is blockchain as a service? • Use case
Further Reading	• BlockChain Principles, Type & Application & Why You Should Care About It? • Design principles for blockchain • Principles of Blockchains • Principles of Successful Blockchain Deployments • Basic blockchain security • Blockchain Design – Explore The Blockchain Principles • Blockchain Technology: Principles and Application in Medical Imaging

Course Content Overview (continued)

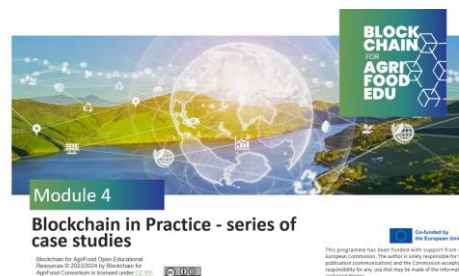| MODULE 3	How To Use Blockchain Technology Within The Agrifood Sector
Overview	This module explores how blockchain technology can be effectively applied within the agrifood sector to enhance efficiency, profitability, and sustainability. It delves into the academic discussions around blockchain's potential, addressing key questions about its implementation—why and how it should be implemented. It covers fundamental blockchain concepts, including how it works, its decentralized nature, and the benefits it can bring to the agrifood supply chain, from increased transparency to improved traceability.
Learning Objectives	Through this module, learners will gain a deep understanding of the key challenges currently facing the agrifood sector and the potential of blockchain technology as a solution. They will analyse blockchain's role in improving supply chain management and providing solutions that benefit farmers, consumers, and the environment. They will assess the advantages and disadvantages of implementing blockchain in the agrifood supply chain. By the end, participants will have both theoretical and practical insights into blockchain's impact on agrifood systems.
Topics Covered	• Introduction • Blockchain and supply chain managment • Blockchain and farmer-centric solutions • Blockchain and environment-centric solutions • Blockchain and consumer relations • Limitations of blockchain's uses in agrifood • Conclusions
Case Studies	• Atea and IBM Food Trust • World Wildlife Fund (WWF) • FishCoin

Course Content Overview (continued)

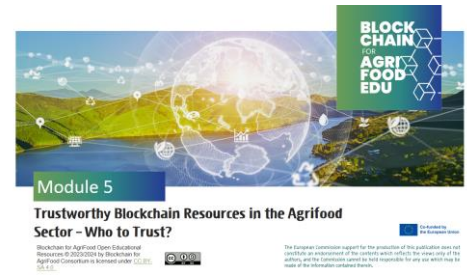| MODULE 3	How To Use Blockchain Technology Within The Agrifood Sector
Further Reading	• UNDP 'Blockchain for Agri-food Traceability' • Blockchain technology adoption, architecture, and sustainable agrifood supply chains • Removing barriers to Blockchain use in circular food supply chains: Practitioner views on achieving operational effectiveness • A global blockchain-based agro-food value chain to facilitate trade and sustainable blocks of healthy lives and food for all • Improving Farmers' Participation in Agri Supply Chains with Blockchain and Smart Contracts • Agriculture on the Blockchain: Sustainable Solutions for Food, Farmers, and Financing • A Systematic Literature Review of Blockchain Technology in Agriculture • The Role of Blockchain in Sustainable Development Goals (SDGs) • Exploring the Hype of Blockchain Adoption in Agri-Food Supply Chain: A Systematic Literature Review • Agriculture-Food Supply Chain Management Based on Blockchain and IoT • Blockchain Technology for Agriculture: Applications and Rationale • Building block(chain)s for a better planet • Traceability Platform Based on Green Blockchain: An Application Case Study in Dairy Supply Chain • The Rise of Blockchain Technology in Agriculture and Food Supply Chains • Is blockchain able to enhance environmental sustainability? A systematic review and research agenda from the perspective of Sustainable Development Goals (SDGs) • What Blockchain Are We Talking About? An Analytical Framework for Understanding Blockchain Applications in Agriculture and Food • The Role of Blockchain Technology in Promoting Traceability Systems in Agri-Food Production and Supply Chains • Digital transformation of the agrifood system: Quantifying the conditioning factors to inform policy planning in the olive sector • Barriers to implementation of blockchain technology in agricultural supply chain • Exploring blockchain technology to transform agrifood systems • Blockchain Technology in Agriculture: Application Techniques

Course Content Overview (continued)

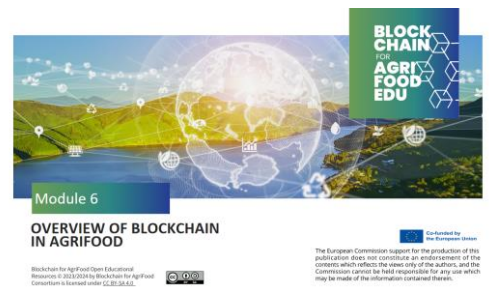| MODULE 4	Blockchain in Practice - series of case studies
Overview	This module takes you through a practical journey of blockchain applications in agrifood. It starts with an introduction then explores the role of blockchain in agricultural supply chains, highlighting the emergence of intermediary platforms and the involvement of retailers. It is designed to showcase how blockchain is being adopted across the agrifood industry, from production to point-of-sale, and the impact this technology is having on the sector. Discover through real-life examples how blockchain is revolutionising the agrifood ecosystem.
Learning Objectives	By the end of Module 4, participants will have a solid understanding of the key principles and mechanisms behind blockchain technology, specifically as applied to the agrifood sector. They will recognise blockchain's role in agricultural supply chains, identifying both its benefits and challenges. Learners will analyse the influence of intermediary platforms and evaluate how retailers integrate blockchain, assessing the motivations and impacts on the supply chain and consumers. Additionally, participants will apply their knowledge through real-world case studies and critically reflect on blockchain's transformative potential in the agrifood industry.
Topics Covered	• The Power of Case Studies, a Module Introduction • Blockchain in Agri Supply Chains • The Rise of Intermediary Platforms • Retailers Are On Board • Learning Exercise and Conclusions
Case Studies	• Iberchain • Alpha Estate Winery • Polish Premium Beef • Albert Hejin's Orange Juice • Provenance • The Rice Exchange • TE-FOOD • OriginChain • EIT Food Unfolded • Carrefour • IBM Food Trust™ Platform
Further Reading	• BlockChain Principles, Type & Application & Why You Should Care About It? • Design principles for blockchain • Principles of Blockchains • Principles of Successful Blockchain Deployments • Basic blockchain security • Blockchain Design – Explore The Blockchain Principles • Blockchain Technology: Principles and Application in Medical Imaging

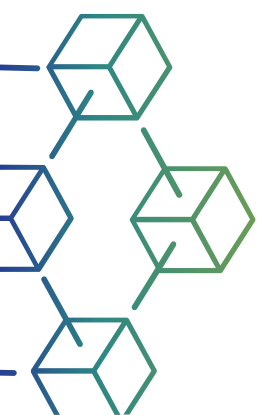# Course Content Overview (continued)

Module 5
Trustworthy Blockchain Resources in the Agrifood
Sector – Who to Trust?

MODULE 5	Trustworthy Blockchain Resources in the Agrifood Sector – Who to Trust?
Overview	This module explores the concept of trust in blockchain technology within the agrifood sector, focusing on its reliability and credibility. It examines to what extent blockchain can be considered a trustworthy tool in agrifood supply chains. Drawing from academic literature, the module addresses critical questions regarding the trustworthiness of blockchain in this industry, analysing its benefits and potential limitations. By the end, participants will gain insights into how blockchain can build trust among stakeholders in the agrifood sector.
Learning Objectives	By the end of this module, participants will have a strong grasp of key terms related to blockchain in the agrifood sector and an understanding of how blockchain is applied within this industry. They will develop a clear knowledge of blockchain's essential features and evaluate its potential as a trusted solution to common challenges in the agrifood supply chain. Learners will also analyse blockchain's role as a trusted technology and critically assess its reliability and trustworthiness in improving transparency and accountability in agrifood systems.
Topics Covered	• Introduction • Key terms • Blockchain Use In The Agrifood Sector • Exercises and Case Studies • What Are The Current Limits Of Blockchain? • Conclusions
Case Studies	• The Bu Bu Chicken project • Shan Liang Taste
Further Reading	• IBM, What is Blockchain Security? • Blockchain as a confidence machine: The problem of trust & challenges of governance • Towards trustworthy blockchains: normative reflections on blockchain-enabled virtual institutions • A general definition of trust • A Blockchain-Based Traceability System in Agri-Food SME: Case Study of a Traditional Bakery • Uncovering the potential of blockchain in the agri-food supply chain: An interdisciplinary case study • International Food and Agribusiness Management Review • The Role of System Trust in Business-to-Consumer Transactions • The impact of a blockchain platform on trust in established relationships: a case study of wine supply chains • Designing for Trust in Blockchain Platforms

Course Content Overview (continued)

MODULE 6	Overview of Blockchain in Agrifood
Overview	This module provides an overview of blockchain technology in the agrifood sector, exploring its role as a digital solution to pressing issues such as trust, sustainability, and supply chain management. The module addresses fundamental questions about what blockchain is, how it works in agriculture, and why it holds potential value. Through real-world applications and case studies, participants will learn how blockchain can transform the agrifood sector and assess its practical uses in improving transparency and efficiency.
Learning Objectives	By the end of this module, learners will develop a solid understanding of the fundamentals of blockchain technology, including its core components, mechanisms, and functions. They will analyse key trends and developments in the agrifood sector, exploring real-world case studies that showcase blockchain's applications. Learners will synthesise the various topics covered in the module to create a comprehensive overview of blockchain's role and impact in the agrifood industry.
Topics Covered	• Introduction to blockchain in the agrifood chain • The building blocks of blockchain • How to use blockchain within the agrifood sector • Blockchain in practice • Trustworthy blockchain sources - who to trust? • Conclusions
Case Studies	• Fishing Industry • Moyee Coffee • CARREFOUR • PROVENANCE

Course Content Overview (continued)

MODULE 6	Overview of Blockchain in Agrifood
Further Reading	**Introduction to Blockchain in the agrifood chain:** • Agriculture Supply Chain Management Based on Blockchain Architecture and Smart Contracts • Survey on the Applications of Blockchain in Agriculture • A Systematic Review of Blockchain Technology Adoption Barriers and Enablers for Smart and Sustainable Agriculture • What Is the Blockchain and What's it Used For? • Importance of data standardization and harmonization in agriculture • Blockchain in the food supply chain **The building blocks of Blockchain and the Blockchain mechanism:** • Permissioned vs permissionless blockchains • Blockchain-based framework for supply chain traceability: A case example of textile and clothing industry • Digital technology data - blockchain • Top 9 blockchain platforms to consider **How to use Blockchain technology within the agrifood sector:** • Blockchain for Agri Food Traceability • Blockchain technology adoption, architecture, and sustainable agri-food supply chains • Removing barriers to Blockchain use in circular food supply chains: Practitioner views on achieving operational effectiveness9 • Improving Farmers' Participation in Agri Supply Chains with Blockchain and Smart Contracts **Blockchain in practice: case studies:** • THE FOOD BLOCKCHAIN • Carrefour uses blockchain to offer consumers greater supply chain transparency • Provenance • Provenance aims to use blockchain technology to prove authenticity • Green credentials not greenwash • Belu case study **Trustworthy Blockchain resources: who to trust?:** • Technology, Humanness, and Trust: Rethinking Trust in Technology • Trust In and Adoption of Online Recommendation Agents • How people anthropomorphize robots • Blockchain technology and traceability in the agrifood industry • Enabling affordances of blockchain in agri-food supply chains: A value-driver framework using Q-methodology • Framework for Assessing Trust in the Use of Blockchain Technology in Agrifood Supply Chains

03

General Instructions for Trainers & Educators

General Instructions for Trainers & Educators

1. Methodological Approach

The Open Education Resources consists of a 6 Module Curriculum to introduce learners to the scope and potential of blockchain technology in the agrifood sector in a way that is both rigorous and congruent with academic research and focused on how blockchain technology is revolutionising the agrifood sector. The course is designed for industry professionals, academics, and anyone interested in the intersection of agriculture and cutting-edge technology. These modules provide detailed insights into blockchain applications, benefits, and challenges within the agrifood supply chain.

2. General Instructions

Please read this guide thoroughly before conducting the training. For classroom, flipped or blended delivery please:
- Download, review & revise course resources for your teaching, as necessary. Allow adequate training time for sessions. The link you need is: **https://blockchainforagrifood.eu/open-educational-resources/**

- Localise training content with case studies and information on local supports for your students

- Ensure that each participant completes exercises embedded in each Module– these provide valuable learning.

- Allow time for review of exercises and provide a feedback loop

3. Instructional Approach

The Open Education Resources have been designed to accommodate a range of teaching styles and cultures. As a common thread, each module is presented with the following design:
- The topic is introduced briefly before delving into the subject matter.

- Information and current best practices on the topic are presented, moving from general definitions to more detailed applications, enabling the scope of the topic to be understood.

- Knowledge is reinforced, and skills are developed as students/learners participate in practical exercises or study questions
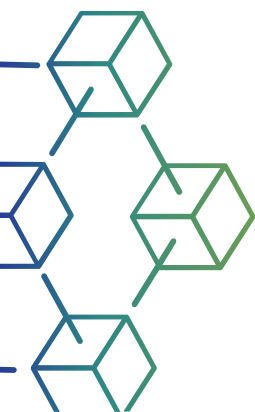
04 Course Delivery Options

Course Delivery Options

a) Traditional Classroom Training & Tools required

Classroom training remains one of the most popular training techniques for building skills capacity. Typically, it is instructor-centered face-to-face training that takes place in a fixed time and place. The Blockchain for Agriood project tools, suggested use and additional resources required can be outlined as …

Classroom Tool	Suggested Use in the Classroom	Additional Resources Required
PowerPoint © presentation	Training materials are developed in PowerPoint. We suggest that these will be displayed on a large screen for classroom delivery	Laptop/ Computer Projector Large screen / wall
Videos	Videos are used to explain certain sections of the training content and to present case studies for discussion.	Audio / sound system
Whiteboard or Flip Chart	Invite learners to write on the board or ask them for feedback that you write on the board	Pens / markers

Suggested delivery mechanisms:

• Small group discussions: Break the participants down into small groups and give them case studies or work situations to discuss or solve. This allows for knowledge transfer between learners.

• Q & A sessions: Informal question-and-answer sessions are most effective with small groups and for updating skills rather than teaching new skills. These should be used frequently across course delivery.

• Multimedia: Multimedia training materials tends to be more provocative and challenging and therefore, more stimulating to the adult mind. Trainers should ensure that all imbedded tools are used to their full potential.

game-based learning and trivia platform used in classrooms, offices, and social settings. You can compile a quiz, which can be answered by the students on their phones/tablets/computers. It is possible to get immediate feedback and results.
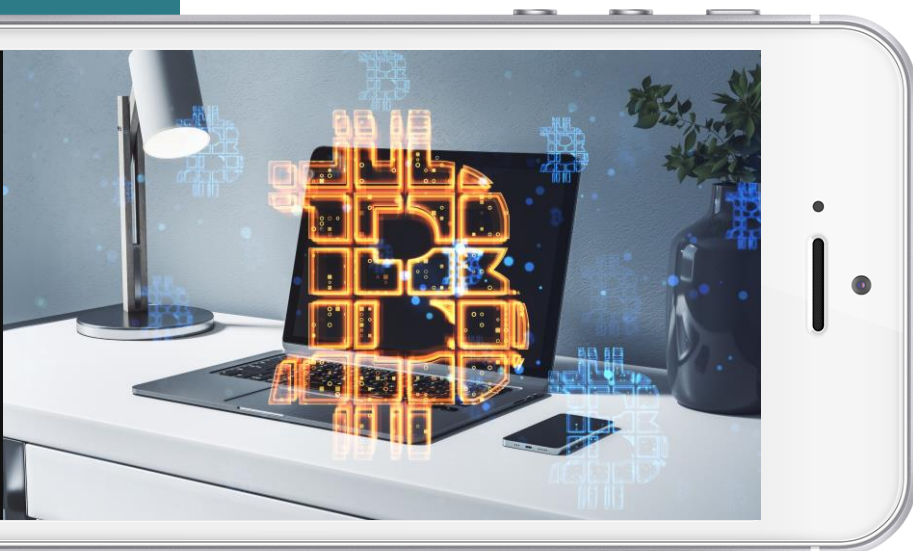
Course Delivery Options (continued)

b) Online Learning:

This delivery method uses Internet technologies embedded in the EFE learning platform to deliver a broad array of solutions to enable learning. The Blockchain for Agrifood Edu course is provided as an online learning programme, for direct access by all stakeholders including trainers, students, Food Entrepreneurs/SMEs & employees, on the topic of blockchain education in the agri-food sector.

The project platform will be a multilingual, interactive site combining informative resources with the aforementioned, Educator's Guide, digitalised exercises and enterprise & innovation skills development activities.

Additional suggested reading and multimedia links. The online learning facility incorporates best practice in online learning so that while the learning objective remains the same (or similar) the user interface and experience can be radically different as befits the medium.

Course Delivery Options (continued)

c) Other teaching methodologies:

Flipped Classroom
In a Flipped Classroom learners study module content prior to the class with a focus on exercises and assignments in class. The classroom transfer of knowledge makes way for online instruction outside the classroom. This creates more room for practicing in class, for extra explanation when needed, and offers the possibility to dive deeper into the materials during class time.

Blended Learning
Blended Learning combines online digital media with traditional classroom methods. It requires the physical presence of both teacher and student, with some element of student control over time, place, path, or pace. Learners still attend a classroom setting with a teacher/trainer present, face-to-face classroom practices are combined with computer-mediated activities regarding content and delivery. Blended learning is most used in professional development and training settings.

Collaborative/Peer-to-Peer Learning
Collaborative learning is an educational approach to teaching and learning that involves groups of learners working together. Examples for boosting collaborative and peer-to-peer learning are:

Peer review: Peers in the classroom are brought together to jointly evaluate the work by one or more people of similar competence to the producers of the work. Peers not only assess the performance of each other but also share their experience and know-how.
Google Docs: This online collaboration tool facilitates the creation of meaningful documents. All group members can work at the same time (real-time) on the same document, from any location on various devices. Changes are automatically saved in documents as being typed upon. It is possible to monitor the revision history of a document where you also can see who made a specific change. The value of Google Docs as a learning resource is that group members can also share documents, chat, and comment on the same.
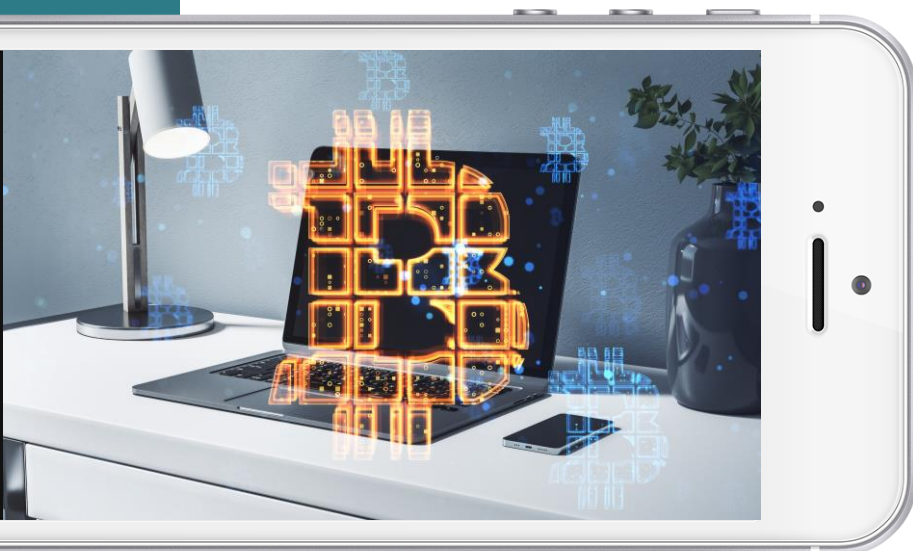
05

Course Content Overview

06 | Develop the Student's Learning Experience

Develop the Student's Learning Experience

The Learning Environment

Create a safe, conducive setting for classroom learning.

Theatre Layout, Size and Technology. Familiarising yourself with the theatre layout and technology beforehand is essential; acoustics, IT and login protocols, remote controls and IT support should you need it on the day. For example, in a large lecture hall clickers or digital polling tools might be more effective than verbal discussions for collecting students' responses. In a smaller context, it might be more appropriate to encourage in-depth discussions and group work.

Class Size and Engagement Preferences. Consider adapting your subject matter to your class size, number of students, and learning preferences even though they apply to the majority of lecture settings. Add variety to enhance student engagement. This improves learning and retention. Students tend to develop critical-thinking attributes and use their knowledge outside the classroom if active participation is facilitated.

Accessible and Inclusive Learning. In addition, nurturing an inclusive and assessable learning environment guarantees that all students have an equal opportunity to have a successful learning experience and gain from the lecture delivery.

Other Suggestions

Consider how can your diverse range of students access what you have to say. Check the advice and support available to lecturers on inclusive learning.

Consider the different requirements for your students by offering lecture materials in a variety of formats such as transcripts, captions, and audio recordings.

Use plain and concise language, avoiding jargon and excessively technical terms that might lead to cognitive overload.

Integrate the principles of **Universal Design For Learning (UDL)** to build an inclusive learning experience for all students, regardless of their backgrounds and abilities.
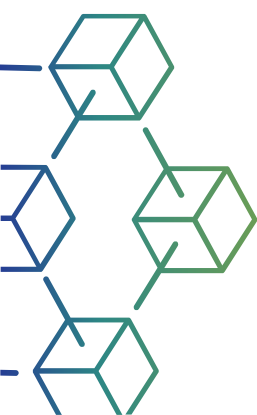
The Online Learning Experience

It is advised to use digital methods where possible to deliver your lecture material to your audience. Utilising technology and multimedia will enhance and diversify the learning experience and encourage student participation. It also provides greater flexibility, more visually appealing interactive content, is a greener option, and is accessible anywhere at any time for students, even post-lecture if necessary.

The Ethical Food Entrepreneurship Programme (EFE) is available both online and via PowerPoint with multiple interactive visual formats such as video, images, and case studies.

The EFE digital and PowerPoint slides are designed with high-quality visual appeal and are not too heavy on text. The text is large, and the content is pitched at a suitable learning level for HEI students. The graphics, videos, and diagrams are colourful, professionally branded, and visually appealing.

Suggestions

Record in small chunks. To aid student learning, record any of the EFE lectures in shorter (5-10 minute) chunks and intersperse them with small activities that give students opportunities to process the new knowledge, make connections to other concepts, apply an idea, or make some notes in response to prompts. An added advantage is that shorter videos lead to smaller files which benefit students reliant on their phones or with poor internet connections.

Be flexible with live video. Lecturing live with Canvas Conferences or comparable tools is certainly possible, and possibly best approximates a classroom setting as students can ask questions. However, some students won't have access to fast internet connections, and others may have conflicting schedules. So, record any live classroom session, and be flexible about how students can attend and participate. Creating a video can be done in a variety of ways you can:
- Record directly over PowerPoint
- Create a screencast
- Record a class via Canvas (or comparable)

Additional Content. Additional basic information or background might be better conveyed via your university's online learning/e-learning/virtual learning environment (VLE). This frees up students to make notes on the important stuff: making connections and reflecting on key concepts.

It's not just about content. For online courses, there is much talk about the importance of "instructor presence", and that's just as true during short-term online stints such as this. So, consider ways that you can use lectures to make students feel connected and cared about: acknowledgement of current challenges, praise for good work, and reminders about the class being a community. This effective work can help their learning.

Source: https://tlu.cit.ie/deliver-lectures
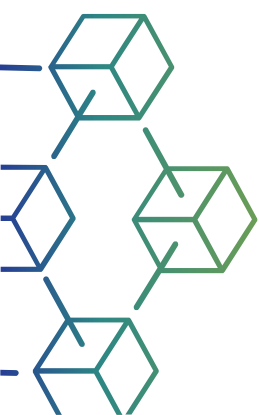
Here are a few suggestions to improve online lectures from Dublin City University, Ireland. If you are considering, delivering a live class then the following resources might be helpful:

DCUs #OpenTeach Project aims to address the challenge of effectively supporting the professional development of part-time educators involved in teaching online higher education programmes. Generally, the project aims to generate new knowledge about effective online teaching practice and harness this new knowledge to support the professional development of online teachers and to support online student learning experiences more effectively. Some useful resources include:

Teaching online is a different report

Teaching Online Takeaway Guides which include several PDFs on the following:

- Getting started with teaching online
- Social Presence
- Social Presence in Large Classes
- Online classes & collaboration
- Supporting online Students
- Facilitating discussion forums

Tips from the Coalface, a series of short videos on online teaching practice:

- Getting Started with Teaching Online
- Teaching Online is Different
- Social Presence in Online Teaching
- Facilitating Discussion Forums
- Live Online Classes
- Supporting Online Students

Advice on giving a webinar for the first time: A Twitter post from Dr Andy Clegg, University of Portsmouth, UK
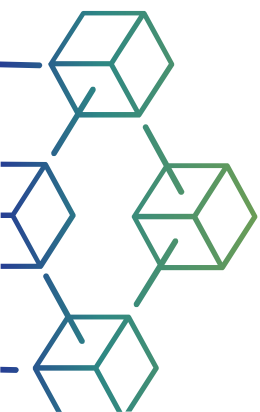
Effective Communication Tips for Lecturers

Tips on Effective Communication and Lecture Delivery

Establish a Rapport: The first five minutes set the tone for the rest of the lecture, and indeed subsequent lectures – get their attention and make the most of it. Make a connection early on; get the students on your side and set a tone. Chat with them as they come in and find out what they are expecting. Introduce yourself at the start of the lecture.

Deliver a Strong Opening. Take a breath and start confidently, enthusiastically, and speak clearly. Calm your nerves by not rushing, slow your talking pace, don't rush, and ensure you're heard. Talk as though you expect attention and understanding - generally, you get it.

Your Voice is Your Superpower. Your voice is your most important resource. If you can't be heard or understood, there's little point in you being there. Check your volume, pace, and pronunciation by running through the first few minutes of your first lecture with a colleague. And if it's a large lecture theatre, ask those at the back to let you know if they can hear you. Use headings and bullet points to prompt your teaching and deliver in a more conversational tone, with spontaneous energy while maintaining eye-contact across the room.

Vary the speed, volume, and tone of your speech to maintain student interest and always convey enthusiasm for the topics covered. Include humour or personal anecdotes to create an engaging environment and further strengthen rapport with students. Allow for moments of silence or contemplation and give students the time to assimilate the material and form their own thoughts, recommendations, and conclusions.

Incorporate Active Learning Methods. The next section will go through this in more detail.

Closing: the 3 rules of giving a good presentation apply:

'Tell them what you're going to say, say it, tell them what you've told them'.

Summarise the key points, suggest what they should do to dig deeper, pose some questions to be explored in the following seminars or tutorials and preview the next lecture.

Assess so you can evaluate learning outcomes. The next section will go through this in more detail.
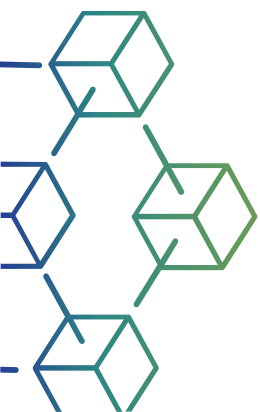
Develop a Cycle of Feedback for Continuous Improvement. Some of the best teachers and lecturers continually get feedback. Evaluate the efficacy of your lectures and identify areas for improvement. Ask students for feedback by asking them to complete anonymous surveys, classroom discussions, and one-on-one conversations. Use this feedback to refine your lecturing approach and better meet the requirements and needs of your students.   If you want to know if you're any good:

- Ask a student: ideally set this up before a lecture and ask them for feedback at the end – usual incentives: free food and drink.

- Ask a colleague to observe: ensure the feedback is specific and balanced – what did you do well? Where could you improve?

Source: Sean Russell, Academic, Research & Teaching
Teaching skills delivering an effective lecture

Students from HEIs across Ireland were invited to vote for the teacher they believed to have the most innovative and inspiring approach to their teaching, and who had a positive effect on student learning. Students identified the traits that good teachers exhibit creative communicators, encouraging, understanding and empathic, instilling a sense of wonder or curiosity (amazing), helpful and kind, inspiring, engaging, passionate about the subject and dimensions of their discipline, and creating

dynamics of excitement in the classroom.
'A Handbook and Tool Kit for Higher Education Institutions In Ireland'

Get Connected to Other Groups and Professional Bodies

Get connected to other groups and professional bodies engaged in supporting HEI teaching, including:

- National Forum for the Enhancement of Teaching and Learning in Higher Education
- The National Institute for Digital Learning (NIDL)
- Staff and Educational Development Association (SEDA)
- Educational Developers in Ireland Network (EDIN)
- Association for Learning Technology (ALT)
- EDEN Digital Learning Europe
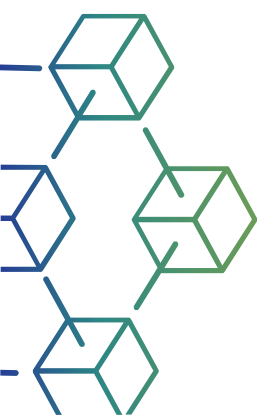
Effective Communication Delivery to Students

Communicating effectively with students creates a positive learning environment and fosters student success. Good communication skills enable teachers to build strong relationships with students, parents, and colleagues.

Communication is both expressive and receptive. Educators should be **skilled in listening** and **understanding in thoughts and ideas** of their students and elaborating things clearly. Educators need clarity in communication while talking to their students. They should be able to **break down complex things into simple steps**. Effective communication works when the speaker can **concisely convey their message** and the listener can **actively listen** and **interpret the message**. When the speaker avoids using filler words, being ambiguous about their intent, and mumbling, they save time and streamline learning capability.

Communication with students in both formal and informal ways such as providing an informal lecture video, role pays, gaming or a formal didactic lecture, tutorial, and workshop. Other types of **formal communication** are programme and module handbooks, clear assessment guidelines, reading lists, clear deadlines for submission of assessments and a calendar for the academic year, stating the dates of modules and assessments.

Informal communication can occur in the form of drop-in sessions or even in corridors. There are numerous ways of communicating through online social media such as Facebook, Twitter, Tik Tok and Snapchat, and online forums. In this chapter, we will look at communication with students in formal teaching educational situations, where learning takes place. First, it is necessary to look at what we teach (the curriculum).

Deeper communication and a more exciting learning experience can be achieved by incorporating the above formal and informal learning that digs a little deeper into the relation between the mind and activities involved in scenarios, scenes, images, and videos (O'Donoghue 1977, pp. 35-36 cited in Clancy, 2015, p. 153).

It is also important to foster **positive relationships** with students. Fitzmaurice and Coughlan (2007) discuss the importance of having positive and healthy relationships with students. Effective communication helps students **connect with others, express empathy, resolve conflicts**, and establish a supportive network. Strong interpersonal skills enable students to form **meaningful relationships** that can positively impact their academic and personal lives. For communication to be effective, it must be **clear, correct, complete, concise, and compassionate**. We consider these to be the 5 C's of communication, though they may vary depending on who you're asking.
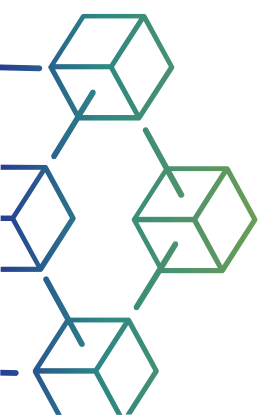
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Useful Links & Resources

Useful Links & Resources

Project Website	https://blockchainforagrifood.eu/
Educator's Guide	https://blockchainforagrifood.eu/guidelines-on-teaching-blockchain/
Learning Resources	https://blockchainforagrifood.eu/open-educational-resources/
Project Facebook Page	https://www.facebook.com/BlockchainforAgrifoodEducators
Project Instagram account	https://www.instagram.com/blockchainforagrifoodeducators
Project LinkedIn Page	https://www.linkedin.com/company/blockchain-for-agrifood-educators/
Project YouTube Page	https://www.youtube.com/@BlockchainAgri-foodEducators