10th International Conference on Sustainable Solid Waste Management

LIFE-C Project

Lidia Lombardi

Niccolò Cusano University, Rome, Italy

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LIFE-C project
Spreading Life Cycle Thinking in higher education

Lidia Lombardi

Niccolò Cusano University

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Chania 2023 - 10th International Conference on Sustainable Solid Waste Management

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The Erasmus+ Program

Since its launch in 1987, the programme has expanded to cover **all areas of education and training**:

- School education;
- Vocational education(VET);
- Higher education;
- Adult education;
- Youth cooperation;
- Sport.

ERASMUS+ Program
Key Actions

- Key Action 1: Learning Mobility of Individuals
- Key Action 2: Cooperation among organizations and institutions
- Key Action 3: Support to policy development and cooperation
- Jean Monett Actions

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The Erasmus+ Program

ERASMUS+ Program
(KA220-HED - Cooperation partnerships in higher education)

Cooperation partnerships in the **Higher Education** sector are international projects aimed at **developing, transferring and implementing innovative practices** and implementing joint initiatives promoting cooperation, peer learning and exchange of experiences **at the European level.**

The effect of this type of project should be primarily the modernization of the educational offer of the university, its better adaptation to the needs of society and the economy, and the improvement of the quality of education.

Results should be reusable, transferable, scalable and, if possible, have a strong interdisciplinary dimension. Selected projects will be expected to share the results of their activities at **local, regional, national and transnational level.**

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Motivation for the LIFE-C project

The need to increase Life Cycle Thinking and LCA awareness in modern societies.

- Providing methods for qualitative and quantitative analysis of the environmental and social impacts of human activities – materializing sustainability, making it tangible.
- Introduction of youth, students (and adults!) of both technical and non-technical faculties with a general idea of LCT – education of future staff to seek and implement *e.g.*, Climate & Energy EU goals.
- Increasing competitiveness of future employees in the job market for the smart industry.

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Promoting life cycle thinking in higher education LIFE-C Erasmus+

The duration of the project is 01/09/2022-31/08/2025

The aim of the project is to **developing a modular LCA / LCC / S-LCA course for higher education** along with a complete set of teaching materials to be implemented at involved Universities.

- **Silesian University of Technology, Gliwice, Poland**
- **University Niccolò Cusano, Rome, Italy**
- **Lappeenranta University of Technology, Finland**
- **National Technical University of Athens, Greece**
- **ValueDo s.r.l., Florence, Italy**

Silesian University of Technology

LUT University

National Technical University of Athens

ValueDo

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Promoting life cycle thinking in higher education LIFE-C Erasmus+

The main expectations from the LIFE-C project are:

- Academic networking and establishing an international cooperation baseline for future projects.
- Promoting Life Cycle Thinking in both academia and among the general public.
- **Releasing an innovative and universal course on an e-learning platform and a handbook with complete guidelines and materials to implement and adjust the modular LIFE-C course for any HEI interested**.

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Promoting life cycle thinking in higher education LIFE-C Erasmus+

WP1 – Project management, quality assurance and evaluation

WP2 - Survey

- Defining the needs and state-of-the-art of the LCA teaching sector, to provide the solutions and answers for recognized educational gaps.

  Oct. 2022- May 2023

WP3 - Preparation

- Preparing a complete set of teaching materials and educational/coaching methodologies for students and teachers to implement and deliver the Life-C course in their Universities.

  Jun. 2023 – May 2024

WP4 – Delivery & Evaluation

- Delivery of the Life-C course for the interested students, collecting the evaluation and recognizing acquired ECTS.

  Jun 2024 – Jul. 2025

WP5 – Dissemination & Exploitation

- Dissemination and exploitation – promoting the Life Cycle Thinking in HE and building the social media presence of the Life C project during conferences, newsletters, profiles, and webinars.

  Sept. 2022 – Aug. 2025.

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WP2 - description and aims

WP2 is aimed at defining the **needs of the students** and the **design principles** for the LCA course.

- identify in details the set of **knowledge**, **skills** and **competencies** that the students need in order to apply and spread the life cycle thinking in their future sectors of employment, to significantly contribute to improve the environmental sustainability on all those sectors;
- identify the principles on which to build the LCA course (in WP3): topics, learning outcomes, duration, etc… educational learning outcomes according to the hierarchical levels of the Bloom's taxonomy: understand, apply, analyse, evaluate, create.
- defining final syllabus: detailed architecture and contents
- defining the training needs of students on the basis of their **background** (interdisciplinary student equality)
- supporting LCA teaching in the use of LCA **devoted IT applications**, by making available an IT tool for the selection of the most appropriate IT applications for the specific teaching/learning need

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WP2 - Specific Actions

- A1 - State-of-the-art of the teaching/learning in the LCA sector (Sep-Oct-Nov 22)
- A2 - Questionnaires with targets groups / defining needs for students with different backgrounds (Nov-Dec 22-Jan 23)
- A3 - Defining course content (Feb-Mar 23)
- A4 - Analysis of digital tools available for LCA (Apr-Mag 23 → online Jun 23)

	set-22	ott-22	nov-22	dic-22	gen-23	feb-23	mar-23	apr-23	mag-23
	M1	M2	M3	M4	M5	M6	M7	M8	M9
WP2 - Survey and Need Analysis									
A1 State-of-the-art of the teaching/learning in the LCA sector									
A2: Questionnaires with targets groups / defining needs for students with different backgrounds									
A3: Defining course content									
A4: Analysis of digital tools available for LCA (free for students)									

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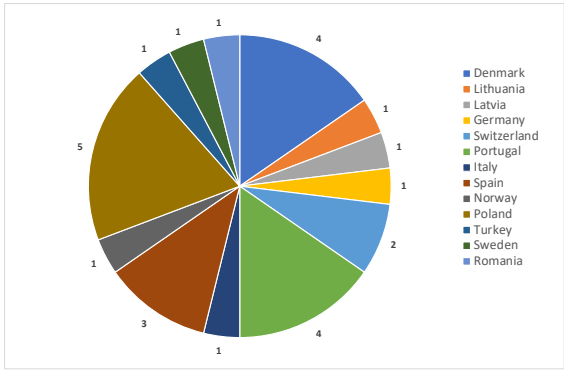
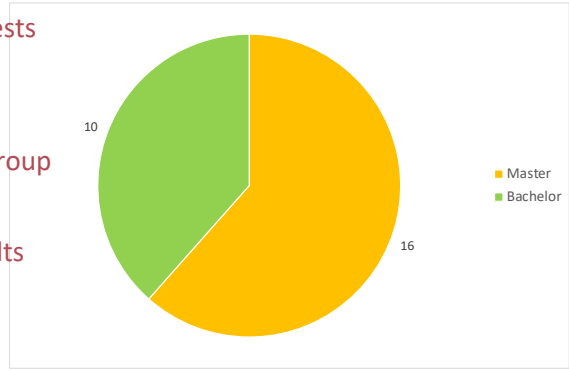
A1 - “State-of-the-art of the teaching/learning in the LCA sector”

Country		
University		
Faculty/Faculties		
Study programme/programmes for which the class/module is proposed	Master	
	Bachelor	
Module/class title		
Lecturer’s name and contact (list the names if more than one)		
List of contents		
Learning Outcomes - Bloom’s taxonomy	Understand	
	Apply	
	Analyze	
	Evaluate	
	Create	
n. of ECTS		
Semester/period of teaching (n. months)		
Teaching methods	Theory	
	Practice	
	Seminars	
	Visits	
	Assignments	
Exams/evaluation		
Language of lecturing		
Language of teaching materials		
Is the teaching material publicly available?		
List of reference texts or references		
Software	Which software	
	How software is used	
	How software is available for students	
ADDITIONAL		
Since how long the class/module has been offered?		
Number of students per year?		
Evaluation/feedback from students available?		

- **Teaching material**
  - Not publicly available



- Almost all report “lecture” in the “Theory”….
- Practice/Assignment are overlapping, some examples:
  - Case study in project teams in collaboration with external company
  - in class mandatory group assignments and exercises, individual tests
  - Group work, group assignments
  - Exercises
  - A project on Life cycle assessment is analyzed by the student in group
  - Presentations on selected topics by the students
  - Presentation and discussion of the LCA project proposal and results
  - specialized software demonstration
  - Team/Group Work
  - Brain Storming…..



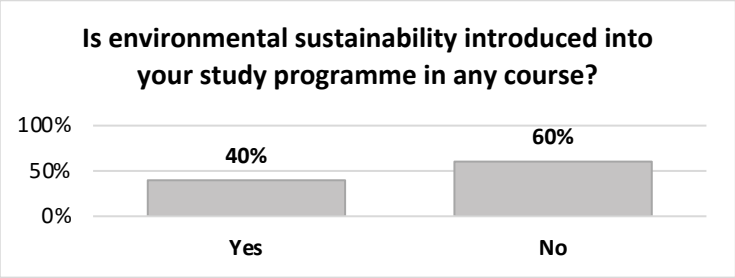
Contents

- 17 syllabuses report module/class mainly devoted to LCA
- 9 syllabuses report module/class where LCA is introduced at some stage (but it is not the main subject)

A2 - “Questionnaires with targets groups / defining needs for students with different backgrounds”

Is environmental sustainability introduced into your study programme in any course?

Students > 400

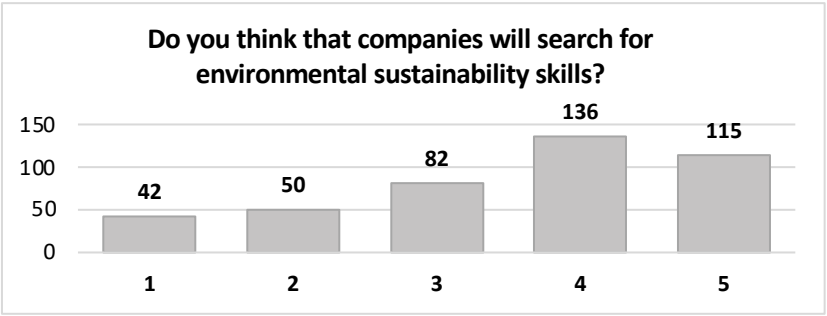


	ENVIRONMENT COURSE	NON ENVIRONMENT COURSE
Yes	53%	31%
No	47%	69%

	BSC	MSC
Yes	36%	43%
No	64%	57%

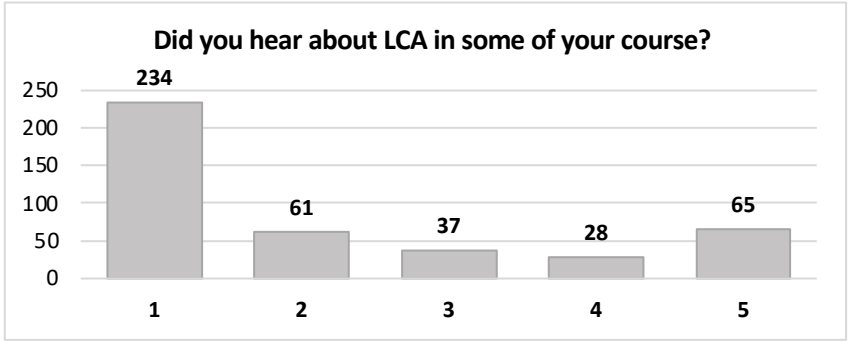
	ENGINEERING	ECONOMICS	OTHER FACULTIES
Yes	50%	28%	28%
No	50%	72%	72%

Do you think that companies will search for environmental sustainability skills?



No	Partially no	I don't known	Partially yes	Yes
10%	12%	19%	32%	27%
22%			59%	

Did you hear about LCA in some of your course?



No	Partially no	I don't known	Partially yes	Yes
55%	14%	9%	7%	15%
69%			22%	

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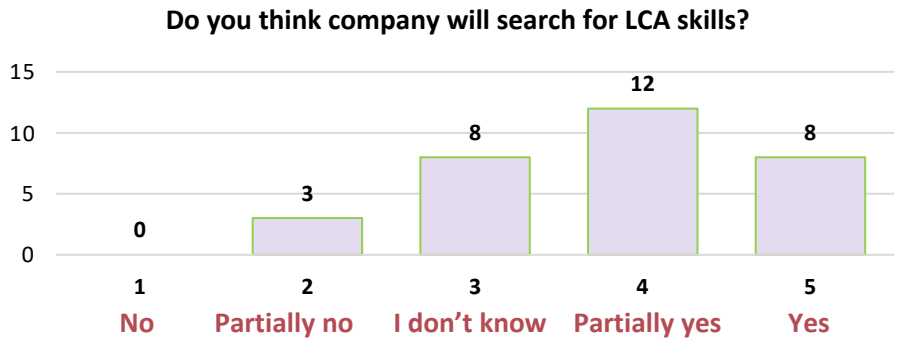
A2 - “Questionnaires with targets groups / defining needs for students with different backgrounds”

Do you think company will search LCA skills?

Companies > 30



Please, add any comment or suggestion related to LCA (optional)

- We are growing in this field and we think LCA will become mandatory for every product. If only 0.5% of the engineering job will be LCA, we will need about 25 Experts (100% LCA) just for our company.
- LCA field is growing and needs experts! But it also needs more generic understanding of the process by non-LCA experts to be able to understand the results and communicate them.

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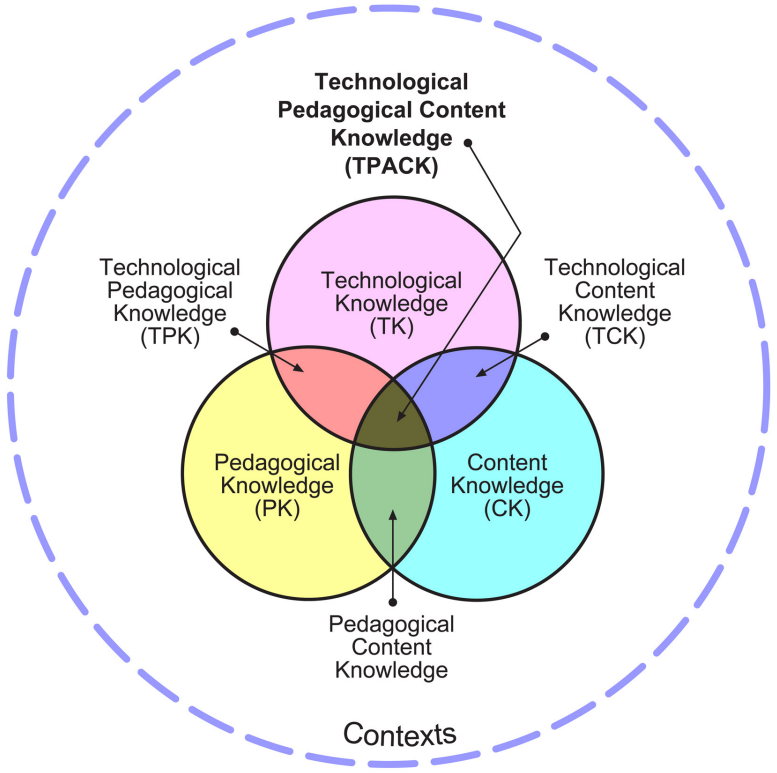
WP2: Presentation and validation of the syllabus – A3



Study programme/programmes for which the class/module is proposed	Master	
	Bachelor	
Module/class title		
Lecturer's name and contact (list the names if more than one)		
List of contents		
Learning Outcomes - Bloom's taxonomy	Understand	
	Apply	
	Analyze	
	Evaluate	
	Create	
n. of ECTS		
Semester/period of teaching (n. months)		
Teaching methods	Theory	
	Practice	
	Seminars	
	Visits	
	Assignments	
Exams/evaluation		
Language of lecturing		
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Is the teaching material publicly available?		
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Software	Which software	
	How software is used	
	How software is available for students	
ADDITIONAL		
Since how long the class/module has been offered?		
Number of students per year?		
Evaluation/feedback from students available?		

We need to define:

- Contents
- Pedagogical approaches
- Technologies we want to use

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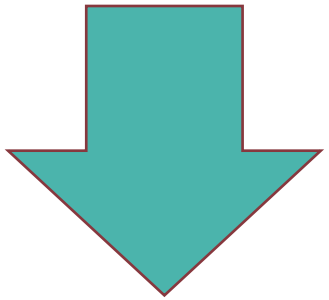
WP2: Presentation and validation of the syllabus – A3

- **Contents**

	Module 1	Module 2	Module 3
Future/envisioned professional profiles of students	**Engineers and managers who can relate to LCA utilisation, commission LCA studies and take decisions/ actions from LCA results**	**Engineers and managers able to conduct and interpret LCA studies**	**Engineers and managers who can relate to Social LCA/LCC utilisation, commission Social LCA/LCC studies and take decisions/ actions from Social LCA/LCC results**
	Practical exercises Assignments	 Company challenges Study cases	Practical exercises Assignments

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Thank you for your attention!

Please, visit our webpage: **www.life-c.eu**

And sign up for our Newsletter to get the newest updates on the LIFE-C project!

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The Erasmus+ Program

ERASMUS+ Program
(KA220-HED - Cooperation partnerships in higher education)

In addition to complying with the formal criteria and horizontal and specific sector priorities (summarized in the following slides), the call encourages the applicants to consider other transversal aspects when designing the project for the Cooperation Partnerships: **1) environmental sustainability, 2) inclusion and diversity, 3) digital dimension.** These elements, which coincide with the horizontal priorities of the call, contribute to increasing the impact and qualitative implementation of the project throughout its different phases.

For projects in the field of education, training and youth managed by the Erasmus+ National Agencies at decentralised level, National Agencies may, among the priorities summarized below, give more consideration to those that are particularly relevant in their national context (called **"European priorities in the national context"**).

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The primary objectives of Cooperation Partnerships are:

- Increasing quality in the work, activities, and practices of organizations and institutions involved, opening up to new actors, not naturally included within one sector;
- Building capacity of organizations to work transnationally and across sectors;
- Addressing common needs and priorities in the fields of education, training, youth and sport;
- Enabling transformation and change (at individual, organizational or sectoral level), leading to improvements and new approaches, in proportion to the context of each organization

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Horizontal Priorities

Inclusion and diversity

Addressing digital transformation through development of digital readiness

Environment and fight against climate change (environmental sustainability)

Common values, civic engagement and participation

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Higher Education priorities

Promoting inter-connected higher education systems

Stimulating innovative learning and teaching practices to tackle societal challenges

Developing STEM/STEAM in higher education, in particular women participation in STEM

Rewarding excellence in learning, teaching and skills development

Building inclusive higher education systems

Supporting innovation and entrepreneurial skills of students

Supporting digital and green capabilities of the higher education sector

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