GREEN AND DIGITAL SKILLS DEVELOPMENT FOR EUROPEAN ENGINEERING PHD CANDIDATES

TRAINING ACTIVITIES EVALUATION REPORT

Co-funded by
the European Union

TECSKILL
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INDEX

1 INTRODUCTION

The Tecskill project is an international collaborative initiative involving four European universities: the Universidade de Évora (Portugal), the University of Extremadura (Spain), the Högskolan i Gävle (Sweden), and the Università di Parma (Italy). TECSKILL promotes international and innovative training experiences through workshops, lectures, and social activities.

Several workshops were developed for PhD students to help them acquire digital and green skills through innovative methodologies delivered by the project's participating professors.

To assess the effectiveness of these methodologies, several surveys were implemented:

- Satisfaction surveys: addressed to professors and students to evaluate the methodology used in the workshops.
- Competence surveys: students indicated which green and digital competences were most related to the development of their thesis.
- Self-assessment surveys: carried out at the beginning and end of the project, in which students evaluated their own level of development in each of the indicators that make up the competences addressed.
- Activity contribution surveys: aimed at the expert panel of WP2 and WP3 (16 experts, 4 from each university). Their objective was to assess the contribution index of the teaching and learning activities to the acquisition of competences. The results showed that 100% of the experts consider transnational training to be highly contributory to competence development.

The purpose of this document is to analyse the results of each survey and provide an overview of the impact of the training delivered within the Tecskill project. Specifically, it compiles analyses of teaching and learning experiences, satisfaction, the quality of the knowledge transmitted, and the results obtained from the evaluation methods applied.

2 REPORT OBJECTIVES

2.1 General Objective

To analyse the teaching and learning experiences of the students and professors participating in the Tecskill project, as well as to evaluate the results obtained through the different assessment methods applied (satisfaction surveys, competence surveys, and self-assessments).

2.2 Specific Objectives

- SO1: To evaluate the satisfaction of professors and students regarding the methodologies used in the workshops conducted during the Tecskill project.
- SO2: To identify the digital and green competences that students consider most related to the development of their doctoral theses.
- SO3: To analyse the evolution of students' competence levels by comparing the results of the self-assessment surveys conducted at the beginning and at the end of the project.
- SO4: To assess the effectiveness of the innovative methodologies applied in the workshops for the development of digital and green competences.
- SO5: To provide an overall view of the educational impact generated by the project's activities, including workshops, lectures, and social activities.
- SO6: To summarise the perception of the quality and usefulness of the knowledge delivered during the project's training activities.

3 METHODOLOGIES EMPLOYED

3.1 EXPERT PANEL

3.1.1 ACTIVITY CONTRIBUTION SURVEY

A survey was conducted with an expert panel for WP2 and WP3 to assess the contribution of transnational training activities to competence development. The results will be presented later.

3.2 PROFESSORS

3.2.1 SATISFACTION SURVEY

This survey was previously presented and described in earlier reports, where its purpose and structure were explained. In this document, only the results obtained from its application to the participating professors are analysed.

3.3 STUDENTS

3.3.1 SATISFACTION SURVEY

Previous reports documented the implementation of this survey, aimed at participating students, to evaluate their level of satisfaction with the methodologies employed in the workshops. This report presents and analyses in detail the results obtained.

3.3.2 COMPETENCE SELF-ASSESSMENT SURVEY

The content and methodology of this survey were explained in report R2.2, which described the process by which students evaluated their performance on the indicators associated with the competences addressed—both at the beginning and at the end of the project. The conditions demonstrating the acquisition of a given competence were also specified. This document provides a detailed analysis of the data obtained and of the observed competence development.

3.3.3 THESIS-COMPETENCES SURVEY

This survey is presented for the first time in this report. Its purpose was to identify the relationship between the participants' doctoral theses and the green and digital competences with which they feel most identified or which they consider most closely linked to their research. It was developed using Google Forms. The survey is included as an annex.

4 ANALYSIS OF RESULTS

The following section analyses the results of each of the surveys conducted.

4.1 EXPERT PANEL

4.1.1 ACTIVITY CONTRIBUTION SURVEY

In the survey conducted with the expert panel, in which the contribution of the teaching and learning activities to competence development was assessed, 100% of the participants rated this contribution as high.

4.2 PROFESSORS

4.2.1 SATISFACTION SURVEY

Below are the results obtained from the satisfaction surveys completed by the professors:

- 50% of the professors focused on digital competences, 12% on green competences, and the remaining 38% on both.
- 80% of the professors reported a high level of satisfaction with the methodology proposed in the project, while the remaining 20% reported a medium level of satisfaction.
- 80% of the professors consider the methodology used to be appropriate and adequate, whereas the remaining 20% rated it at an intermediate level.
- 100% of the professors felt comfortable applying the different methodologies.
- 90% of the professors facilitated the active role of the student as the protagonist of their own learning, while the remaining 10% did not.
- Only 20% of the professors used gamification during the sessions.
- 50% of the professors implemented Research-Based Learning (RBL) to enable students to explore, formulate hypotheses, and analyse data.
- 85% of the professors proposed real or simulated challenges (CBL) in their classes to promote critical thinking and creativity.
- 57% of the professors used Project-Based Learning (PBL) as the main strategy in their classes.

Below are several charts that present the results in a more visual way:

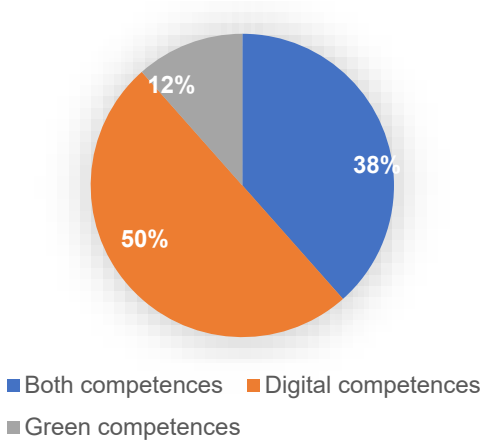

Figure 1: Competence focus

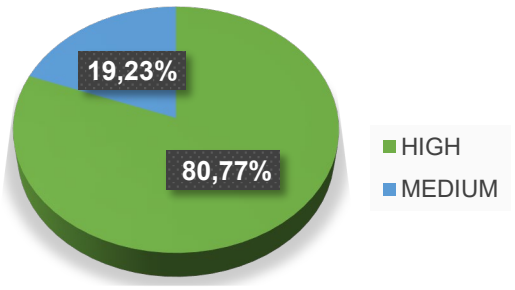

Figure 2: Satisfaction with the methodology employed

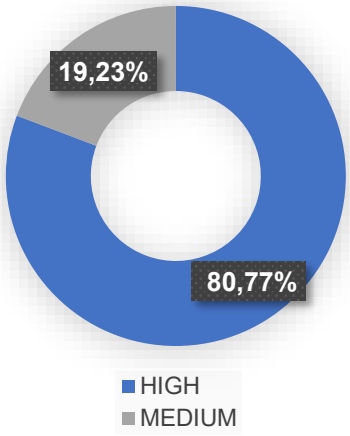

Figure 3: Satisfaction with methodology appropriateness

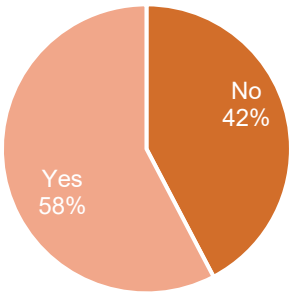

Figure 4: Use of PBL in the sessions

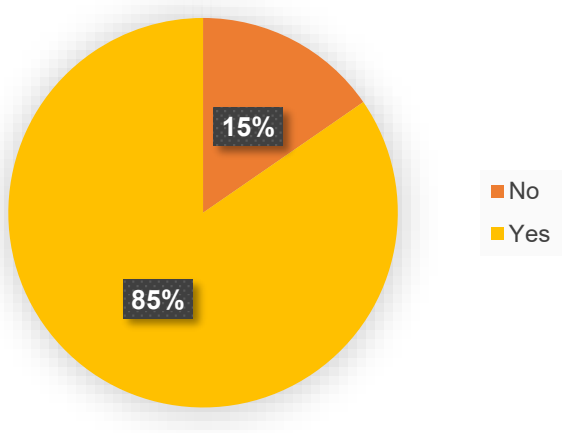

Figure 5: Use of CBL in the sessions

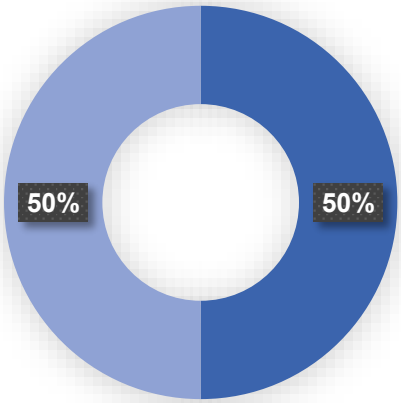

Figure 6: Use of RBL in the sessions

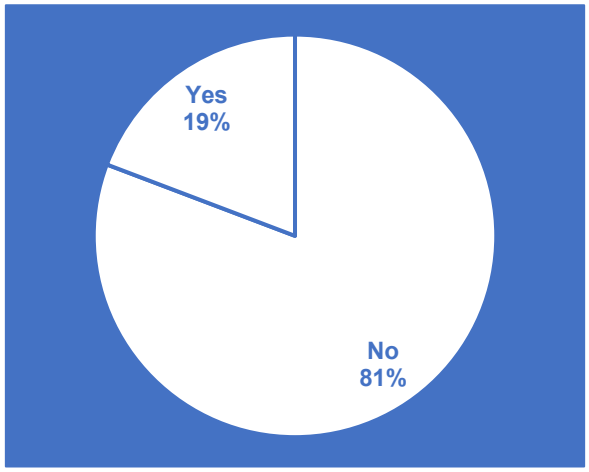

Figure 7: Use of gamification in the sessions

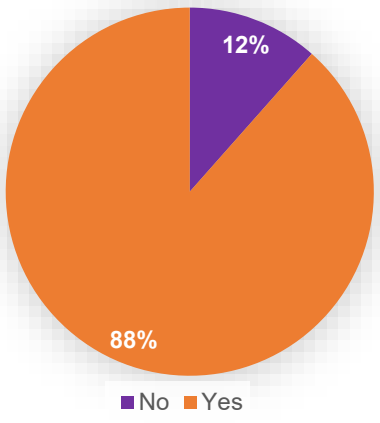

Figure 9: Facilitate the active role of the student

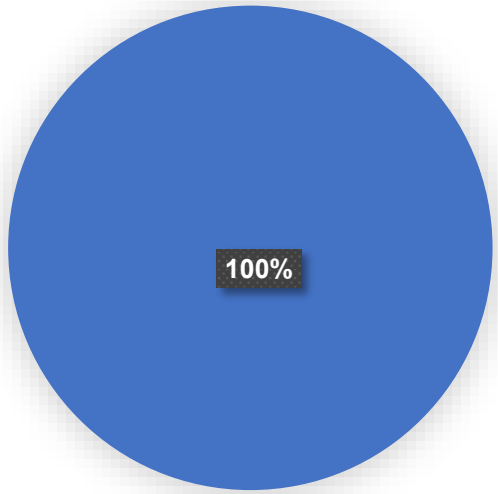

Figure 8: Feel comfortable applying the methodologies

4.3 STUDENTS

4.3.1 SATISFACTION SURVEY

Below are the results obtained from the satisfaction surveys completed by the students:

- 95% of the students assigned a high level of satisfaction to the organization of the training programs, while 5% indicated a medium level.
- 64% of the students are highly satisfied with the practicality and applicability of the session content, and 36% reported a medium level of satisfaction.
- 73% of the students rated the suitability of the methodology for PhD students in engineering with a high level of satisfaction, while 27% reported a medium level.
- 90% of the students showed a high level of satisfaction with the support received when facing difficulties, and 10% indicated a medium level.
- 100% of the students are highly satisfied with the collaboration among participants during the programs.
- 85% of the students indicated a high level of satisfaction with the knowledge gained through interaction with other participants, and 15% reported a medium level.
- 100% of the students rated the opportunity to visit other countries and experience other cultures through the program with a high level of satisfaction.
- 90% of the students showed a high level of satisfaction with the opportunity to interact and participate with others during extracurricular activities, while 10% indicated a medium level.

- 53% of the students reported a high level of satisfaction with the improvement in evaluating sustainable aspects in research, thanks to the program activities; 42% indicated a medium level, and 5% a low level.
- 73% of the students reported a high level of satisfaction with the improvement in using digital tools for data analysis and research, while 27% indicated a medium level.
- 63% of the students rated the relevance of the activities for their professional and academic goals with a high level of satisfaction, 31% indicated a medium level, and 6% a low level.
- 79% of the students reported a high level of satisfaction with the extent to which the training programs met their expectations, and 21% reported a medium level.
- 100% of the students indicated a high level of satisfaction in recommending participation to other students in future Tecskill projects.
- 90% of the students reported a high level of satisfaction with the possibility of participating in a similar project in the future, and 10% indicated a medium level.

Below are several charts presenting the results in a more visual way:

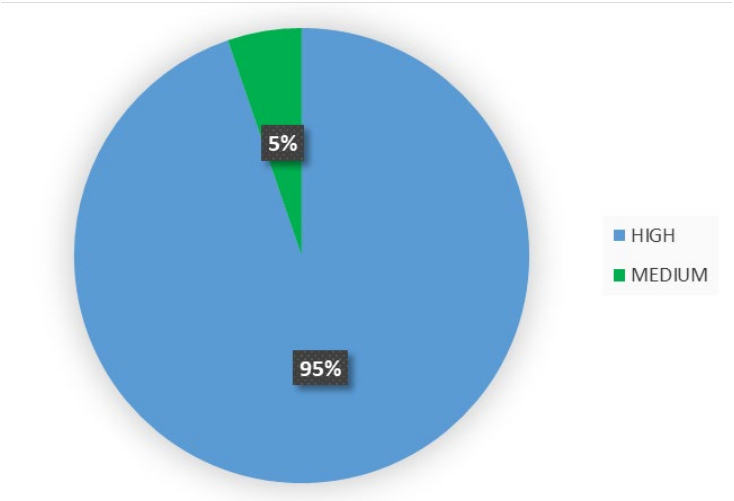

Figure 10: Satisfaction with the organisation of the training programs

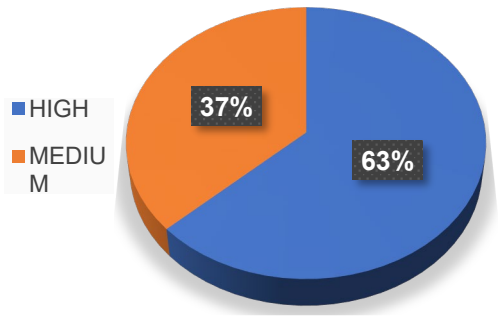

Figure 11: Satisfaction with the applicability and practicality of the training sessions

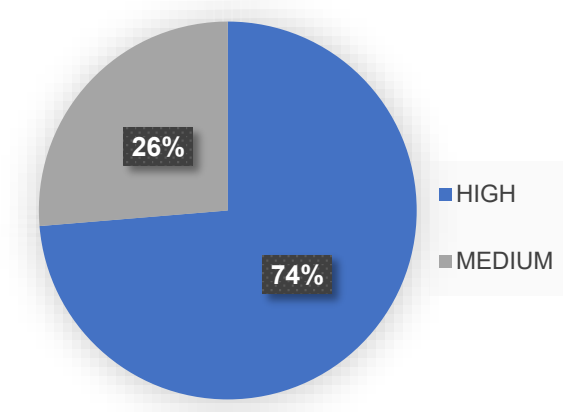

Figure 13: Satisfaction with the suitability of the methodology employed

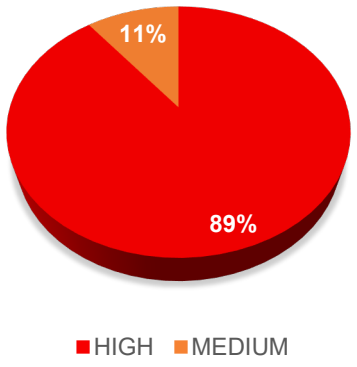

Figure 12: Satisfaction with the support when difficulties arise

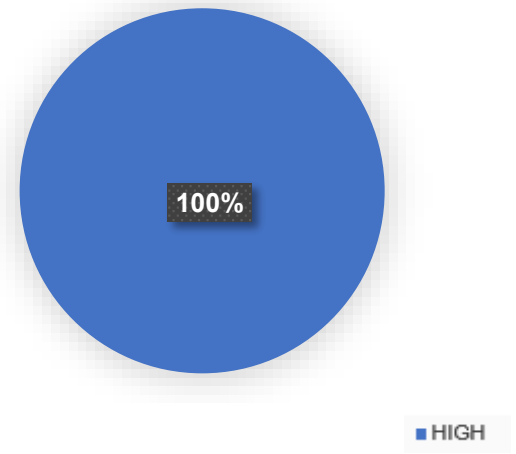

Figure 14: Satisfaction with the collaboration among participants

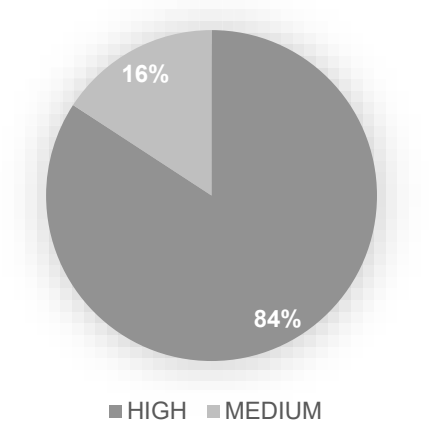

Figure 15: Satisfaction about gaining valuable insights from interaction with the other participants

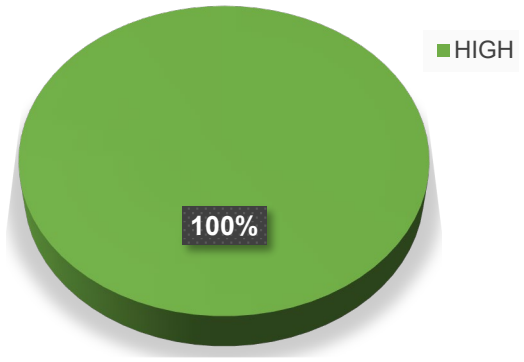

Figure 16: Satisfaction with the opportunity to visit different countries

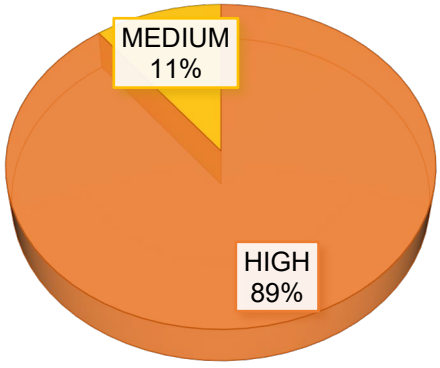

Figure 17: Satisfaction with the bonding opportunities with other participants during extracurricular activities.

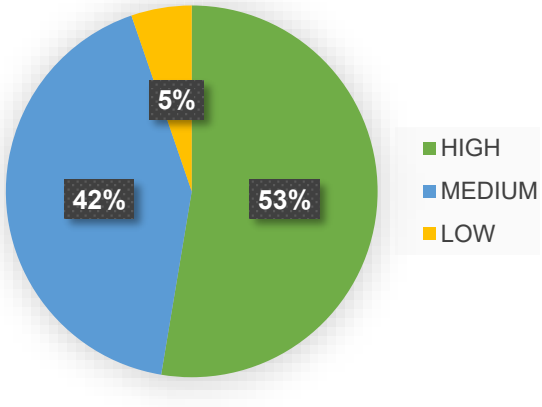

Figure 18: Satisfaction with the improve evaluating sustainability issues in research

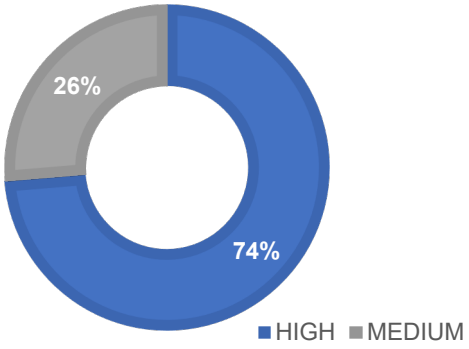

Figure 19: Satisfaction with Improvement in Digital Skills for Data Analysis and Research

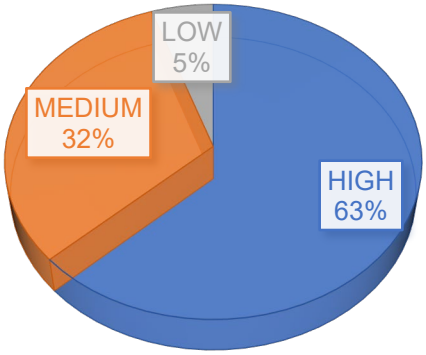

Figure 20: Satisfaction with the relevance of the training program in their academic and professionals goals

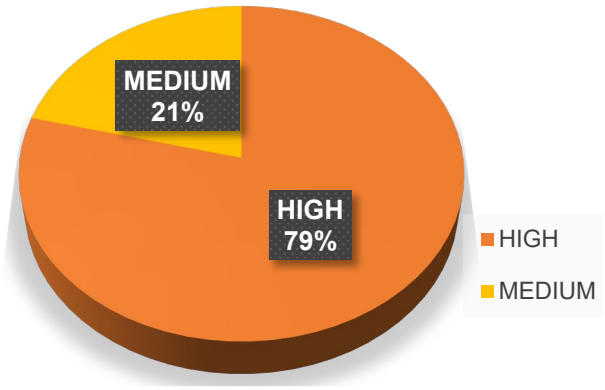

Figure 21: Satisfaction with How Training Programmes Met Expectations

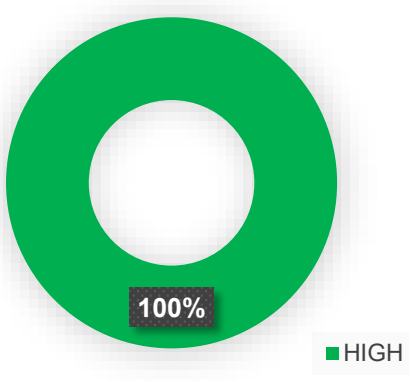

Figure 22: Satisfaction with Willingness to Recommend the Project

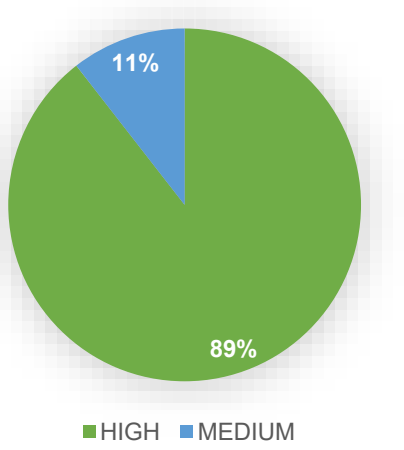

Figure 23: Satisfaction with Willingness to Participate Again

4.3.2 COMPETENCES SELF-ASSESSMENT SURVEY

Below are the results of the competence self-assessment surveys completed by students at the beginning and end of the project.

As indicated in previous reports, each competence, both green and digital, comprises several performance indicators, each with 4 possible levels of progression. For each student, the value of each competence was calculated by averaging the numerical progression levels of its indicators. In this way, in line with the conditions established in report R2.2 for competence acquisition, it was possible to assess whether students had acquired each competence.

Additionally, for the results analysis, the total score per student was calculated as the average of the scores across all competences, as well as the mean scores per competence and the overall average score for all students.

The main results obtained are as follows:

- All the students who participated in the project met the condition that at least 75% of the indicators for all competences reached a progression level of 2 or higher.
- All students achieved an average level of 2 in each competence. The students' average score was 2.71 in the final survey and 1.87 in the initial survey.
- The total score per student in the final survey ranged from 2.22 to 3.35. In the initial survey, scores ranged from 1.18 to 2.22.
- The mean value obtained by students in the final survey is 2.73, compared to 1.82 in the initial survey, showing a significant improvement throughout the project.
- Individual differences between initial and final scores ranged from 0.26 to 1.74

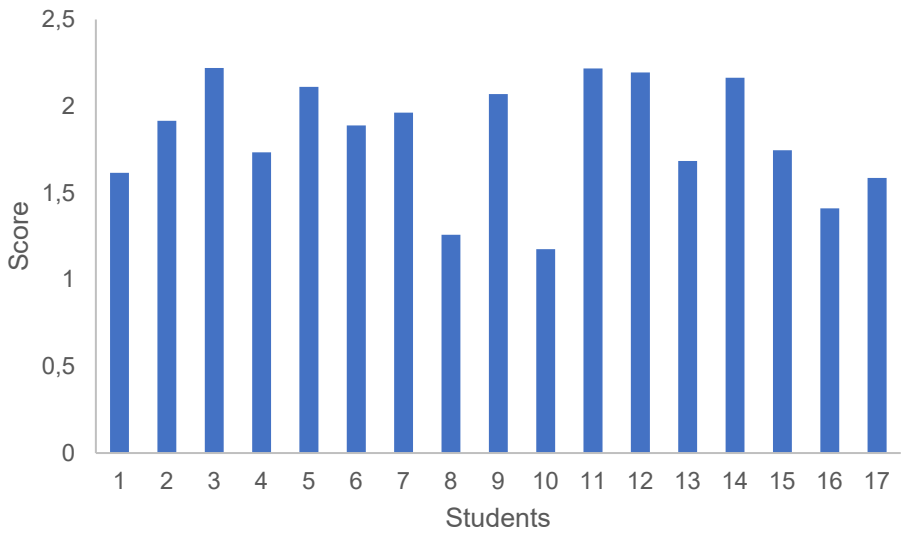

Figure 24: Score obtained by students in the initial survey

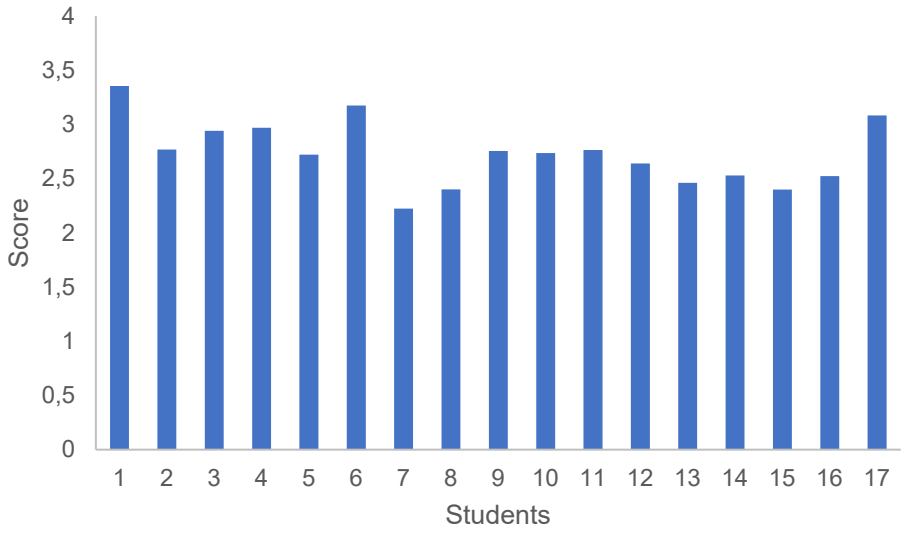

Figure 25: Score obtained by students in the final survey

4.3.3 THESIS-COMPETENCES SURVEY

To analyse survey data in which students linked their theses to the competences they feel most identified with, an Excel template was developed to standardize the collected data. This template is attached as an Annex.

The results obtained are as follows:

DIGITAL COMPETENCES

- The competences most selected by students were 1, 2, and 3, chosen by 92.86% of the students.
- Competence 18 was chosen by 85.71% of the students.
- Competence 17 was chosen by 64.29% of the students.
- Competence 13 was chosen by 57.14% of the students.
- Competence 5 was chosen by 50.00% of the students.
- Competences 4, 7, and 20 were chosen by 42.86% of the students.
- Competences 19 and 21 were chosen by 35.71% of the students.
- Competences 12 and 15 were chosen by 28.57% of the students.
- Competences 10, 14, and 16 were chosen by 21.43% of the students.
- Competences 6 and 11 were chosen by 14.29% of the students.
- Competences 8 and 9 were not chosen by any student (0%).
- The most selected digital competences (1, 2, and 3) are as follows:

-(1) Searching and Filtering Data, Information, and Digital Content: Refers to the ability to design and adapt search strategies to locate relevant and high-quality information. It includes selecting appropriate sources and applying filters to obtain accurate results. Overall, it involves efficiently identifying the literature or data required for research.

-(2) Evaluating Data, Information, and Digital Content: Involves critically analysing digital information to determine its reliability, relevance, and quality. It requires judging the validity of the resources found through a systematic process. Its purpose is to ensure that the data used robustly support the research objectives.

-(3) Data, Information, and Digital Content Management: Focuses on effectively organizing, storing, and managing the data generated in a research project. It includes maintaining structured, accessible information using appropriate digital tools or solutions. Its goal is to optimize the handling and availability of content throughout the project cycle.

Below is a bar chart showing each digital competence and the number of students who linked it to their thesis.

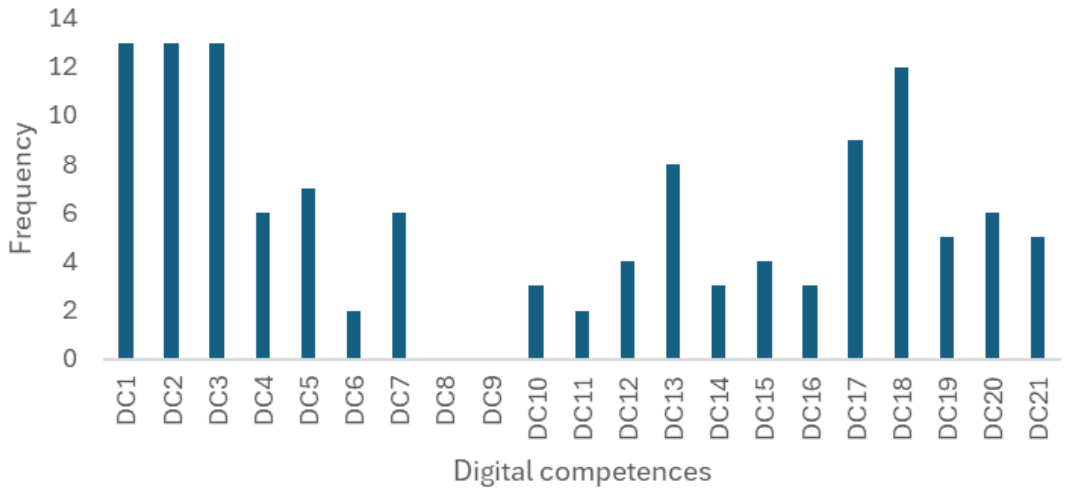

Figure 26: Digital Competences Identified by Students as Relevant to Their Thesis

GREEN COMPETENCES

- The competence most selected by students was 5, chosen by 78.57% of the students.
- Competences 1 and 6 were chosen by 71.43% of the students.
- Competences 4 and 12 were chosen by 64.29% of the students.
- Competences 8 and 9 were chosen by 57.14% of the students.
- Competence 11 was chosen by 35.71% of the students.
- Competences 2 and 3 were chosen by 28.57% of the students.
- Competence 10 was chosen by 21.43% of the students.
- Competence 7 was chosen by 14.29% of the students.

The most selected green competences (5, 1, and 6) are as follows:

-(5) Critical Thinking: Refers to the ability to analyse and evaluate information on sustainability issues from a broad and reflective perspective. It involves questioning assumptions, identifying biases, and gaining a better understanding of the complexity of the topics. Its purpose is to strengthen critical thinking to improve the understanding and assessment of sustainability challenges.

-(1) Valuing Sustainability: Involves reflecting on how one's own decisions and actions affect sustainability within the research context. It includes aligning personal and project values with sustainable principles. The goal is to critically evaluate the impact of the PhD student's actions on sustainability throughout their research career.

-(6) Problem Framing: Focuses on formulating current or potential challenges as sustainability problems, enabling their clear identification. It involves defining appropriate approaches to anticipate, prevent, mitigate, or adapt to these challenges. Its purpose is to enhance the researcher's ability to identify sustainable engineering problems and to develop strategies to solve them.

Below is a bar chart showing each green competence and the number of students who linked it to their thesis.

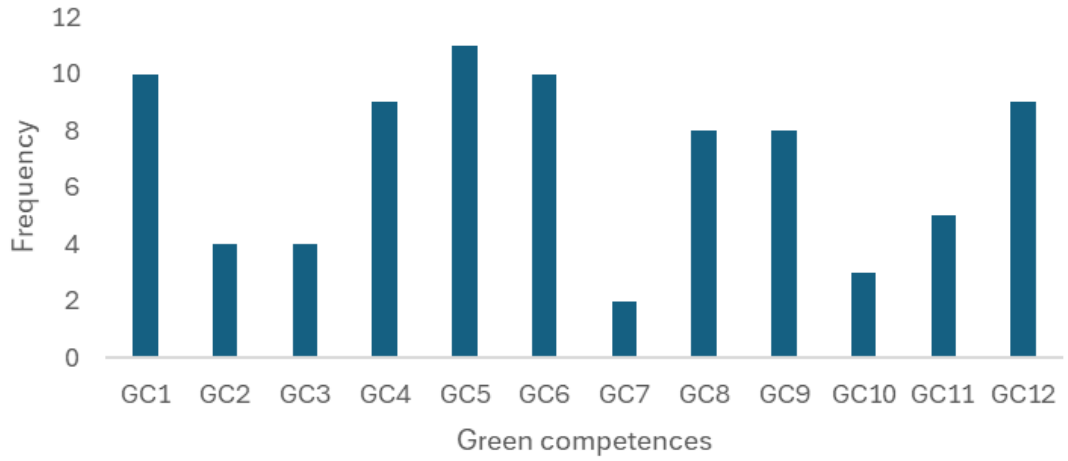

Figure 27: Green Competences Identified by Students as Relevant to Their Thesis

ANNEXES

THESIS-COMPETENCES TEMPLATES

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Raquel Cañada Martín-Romo				
University	University of Extremadura				
Thesis title (even tentative)	Systems thinking approach and multi-criteria evaluation of Critical Success Factors and Success Criteria in R&D&I projects.				
Main aim of thesis	The overall objective of the thesis is to generate empirical knowledge about the factors and criteria for success in R&D&I in order to construct and validate a quantitative and qualitative model that identifies and ranks the characteristics that affect the success of R&D projects.				
Green Competences	GC4; GC5, GC6; GC9, GC12				
Digital Competences	DC1; DC2; DC3; DC7; DC15; DC18; DC20; DC21				
Competence assessment	Item count	Green Comp	*5*	DigComp	*8*
Thoughts on the experience of transnational training	The transnational training was an inspiring experience that helped me link my research on R&D project success with practical insights into green and digital transformation. Collaborating with participants from different countries allowed me to see how sustainability and digitalization are becoming essential factors in innovation performance. The sessions strengthened my analytical and methodological skills and gave me fresh perspectives on how digital tools and responsible practices can shape more effective, impactful, and future-oriented R&D projects.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	José Manuel Díaz Rasero				
University	University of Extremadura				
Thesis title (even tentative)	Applicability of hydrocarbonization products from strategic biomasses for environmental and energy uses				
Main aim of thesis	The aim of this thesis is the valorization of biomass waste for energy use or in agricultural soil amendment processes				
Green Competences	GC1; GC2; GC3, GC7; GC8, GC10; GC11; GC12				
Digital Competences	DC1; DC2; DC3; DC6; DC16; DC17; DC18; DC20				
Competence assessment	Item count	Green Comp	*8*	DigComp	*8*
Thoughts on the experience of transnational training	The training was a great opportunity to connect my research on biomass waste valorization with the broader goals of sustainability and digital innovation. Sharing experiences with other participants helped me understand how digital tools can optimize energy recovery and circular processes. I gained new ideas for improving the environmental impact of biomass use and for applying green competences to make waste management more efficient and sustainable.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Alejandro Martínez Martínez				
University	University of Extremadura				
Thesis title (even tentative)	Design and construction project for a micro-cogeneration system fuelled by biofuels				
Main aim of thesis	The main objective of the thesis is to build a micro turbine for the joint production of electricity and heat. The system will be powered by biofuels, combining the high efficiency of cogeneration with the use of sustainable fuels				
Green Competences	GC1; GC4; GC5; GC6; GC8; GC9; GC12				
Digital Competences	DC1; DC2, DC3; DC12; DC17; DC18; DC19				
Competence assessment	Item count	Green Comp	*7*	DigComp	*7*
Thoughts on the experience of transnational training	The training was a valuable opportunity to link my work on biofuel-powered microturbines with broader green and digital strategies. Discussing ideas with peers from different countries helped me explore ways to optimize cogeneration efficiency while reducing environmental impact. I also gained practical insights on using digital tools for monitoring and controlling energy systems, which will support the design of more sustainable, efficient, and innovative solutions for combined heat and power production.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Carmen María Álvez Medina				
University	University of Extremadura				
Thesis title (even tentative)	Production of biofuels and chemicals from CO2 through catalytic process (Fischer-Tropsch)				
Main aim of thesis	The main objective of the thesis is the production of sustainable fuels				
Green Competences	GC1; GC2; GC3; GC5; GC6; GC8; GC9; GC12				
Digital Competences	DC1; DC2; DC3; DC4; DC5; DC12; DC17; DC18; DC19				
Competence assessment	Item count	Green Comp	*8*	DigComp	*9*
Thoughts on the experience of transnational training	The training was very useful for my research on sustainable fuel production, helping me see how green and digital competences can enhance both efficiency and environmental impact. Interacting with peers from different countries offered new perspectives on sustainable processes and innovative technologies. I also learned how digital tools can support monitoring, optimization, and decision-making, strengthening my ability to develop cleaner, more efficient, and impactful solutions in the field of renewable and sustainable fuels.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Yuniarto Wimbo Nugro				
University	University of Gävle				
Thesis title (even tentative)	Process optimization with radio-based measurement methods				
Main aim of thesis	The aim of this thesis is optimize the process by controlling moisture levels to reduce emissions				
Green Competences	GC1; GC4; GC5; GC6; GC8; GC9; GC12				
Digital Competences	DC1; DC2; DC3, DC4; DC5; DC7; DC13; DC14; DC15, DC16; DC18; DC19; DC20; DC21				
Competence assessment	Item count	Green Comp	*7*	DigComp	*14*
Thoughts on the experience of transnational training	The training helped me see how digital tools and green strategies can directly support my research on optimizing processes through moisture control to reduce emissions. Working with international peers gave me new perspectives on sustainable process management and data-driven monitoring. I learned how digitalization can make environmental improvements more measurable and effective, reinforcing my commitment to developing cleaner and more efficient industrial practices.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Nusyba Yesmin				
University	University of Gävle				
Thesis title (even tentative)	Increasing the interpretability of some machine learning techniques in industrial applications				
Main aim of thesis	The aim of this thesis is find the interpretability of Machine Learning with physical insights				
Green Competences	GC4; GC5; GC6; GC9; GC12				
Digital Competences	DC1; DC2; DC3; DC4; DC5; DC10; DC12; DC13; DC15; DC18; DC19				
Competence assessment	Item count	Green Comp	*5*	DigComp	*11*
Thoughts on the experience of transnational training	The training provided great insights for my research on making machine learning more interpretable in industrial settings. Engaging with international participants allowed me to explore practical approaches for combining digital tools with sustainability goals. I learned new ways to visualize and explain AI decisions, making systems not only smarter but also more transparent and trustworthy, which is essential for driving efficient, responsible, and innovative industrial processes.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Muhammad Hassan				
University	University of Gävle				
Thesis title (even tentative)	Reliable predictive maintenance for real-time decision support				
Main aim of thesis	Applying predictive maintenance strategies in the industrial environment				
Green Competences	GC1; GC4				
Digital Competences	DC1; DC2; DC3; DC4; DC5; DC6; DC7; DC13; DC17; DC18; DC20				
Competence assessment	Item count	Green Comp	*2*	DigComp	*11*
Thoughts on the experience of transnational training	The training was really helpful for my research on reliable predictive maintenance in industrial settings. Collaborating with peers from different countries gave me fresh ideas on applying real-time decision support and digital tools to improve efficiency and reduce downtime. I also learned how integrating green and sustainable practices with predictive strategies can make industrial processes smarter, more resilient, and environmentally responsible, enhancing both operational performance and long-term sustainability.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Damu Murali				
University	University of Gävle				
Thesis title (even tentative)	Development of photovoltaic-thermal (PVT) collector				
Main aim of thesis	Development of photovoltaic-thermal (PVT) collector				
Green Competences	GC1; GC4; GC5, GC6; GC8; GC11; GC12				
Digital Competences	DC7; DC10; DC12; DC13; DC17; DC18				
Competence assessment	Item count	Green Comp	7	DigComp	6
Thoughts on the experience of transnational training	The training was a great opportunity to connect my work on photovoltaic-thermal (PVT) collectors with broader green and digital practices. Sharing ideas with international participants helped me explore ways to improve energy efficiency and sustainability in solar technologies. I also learned how digital tools can support monitoring, optimization, and innovative design, reinforcing my ability to develop cleaner, more efficient, and future-oriented renewable energy solutions.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Laura Monferdini				
University	University of Parma				
Thesis title (even tentative)	Frameworks and tools for evaluating logistics processes and enhancing Green, Resilient, Agile and Lean performance (OLOGRAL)				
Main aim of thesis	The aim of this thesis the development of tools for evaluating and improving supply chain performance LARGS				
Green Competences	GC4; GC5, GC6; GC9, GC12				
Digital Competences	DC1; DC2; DC3; DC7; DC15; DC18; DC20; DC21				
Competence assessment	Item count	Green Comp	*5*	DigComp	*8*
Thoughts on the experience of transnational training	The training was very useful for linking my research on logistics evaluation frameworks with the practical application of green and digital competences. I explored how digital tools can enhance data analysis and decision-making in sustainable logistics. Exchanging ideas with peers from different backgrounds helped me understand how to balance Green, Resilient, Agile, and Lean dimensions to improve overall performance and adaptability in modern supply chains.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Luca Preite				
University	University of Parma				
Thesis title (even tentative)	Digital systems for smart crop management in sustainable agriculture				
Main aim of thesis	The aim of this thesis the development of advanced framework supporting digitalization and sustainability in the agri-food sector				
Green Competences	GC1; GC2; GC3, GC6; GC7; GC8; GC10; GC11				
Digital Competences	DC1; DC2; DC3; DC4, DC5; DC7; DC13; DC17; DC21				
Competence assessment	Item count	Green Comp	*8*	DigComp	*9*
Thoughts on the experience of transnational training	The training was a great chance to strengthen the link between my thesis on digitalization and sustainability in the agri-food sector and real European practices. Learning about digital tools and green strategies gave me new ideas to apply in my framework. Collaborating with international participants also broadened my understanding of how technology can drive more sustainable and efficient food systems.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Claudio Suppini				
University	University of Parma				
Thesis title (even tentative)	Simulation-based and AI-driven solutions for optimized management and maintenance of industrial systems				
Main aim of thesis	The aim of this thesis is build and validate an AI algorithm for predictive maintenance and simulative models developped for improving the efficiency of industrial plants				
Green Competences	GC1; GC5; GC11; GC12				
Digital Competences	DC1; DC2; DC3; DC7; DC13; DC18				
Competence assessment	Item count	Green Comp	*4*	DigComp	*6*
Thoughts on the experience of transnational training	Participating in the training helped me connect my research on AI-based predictive maintenance with practical applications in sustainability and digital innovation. Collaborating with international peers offered new ideas for using simulation models to optimize industrial plant efficiency. I also learned how digital tools and data-driven approaches can make maintenance more proactive and resource-efficient, reinforcing my ability to design smarter, greener, and more resilient industrial systems.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Natalya Lysova				
University	University of Parma				
Thesis title (even tentative)	Virtualization approaches for the design, characterization, and control of food industry plants				
Main aim of thesis	Develop advanced integrated tools leveraging numerical simulation results and available data to optimize the management and control of food industry plants for better efficiency, food safety and quality				
Green Competences	GC1; GC4; GC5; GC6; GC9				
Digital Competences	DC1; DC2; DC3; DC10; DC11; DC13; DC14; DC17; DC18; DC19; DC20; DC21				
Competence assessment	Item count	Green Comp	*5*	DigComp	*12*
Thoughts on the experience of transnational training	The training offered a perfect setting to connect my research on optimizing food industry plants with green and digital competences. Working alongside international peers helped me explore how numerical simulations and data-driven tools can improve efficiency, safety, and quality in food production. I also gained new ideas on applying digital monitoring and sustainable practices to make plant management more precise, resilient, and environmentally conscious, strengthening the practical impact of my work.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Maria Vittoria Rizzo				
University	University of Parma				
Thesis title (even tentative)	Life Cycle Assessment of Innovative Flexible Packaging				
Main aim of thesis	The aim of this research is develop a LCA framewor for innovative monomaterial flexible packaging comparison with multi-materials structures				
Green Competences	GC1; GC2; GC3; GC5; GC8; GC10; GC11				
Digital Competences	DC1; DC2; DC3; DC5; DC16; DC17; DC18				
Competence assessment	Item count	Green Comp	7	DigComp	7
Thoughts on the experience of transnational training	The training was a great chance to connect my research on LCA for innovative packaging with practical insights into sustainability and digital tools. Working with international peers helped me explore how life cycle assessment can guide decisions between mono- and multi-material solutions. I also gained ideas on using data-driven approaches to improve environmental performance, making packaging design more efficient, sustainable, and aligned with circular economy principles.				

DEVELOPMENT OF COMPETENCES IN PHD STUDENTS

PhD student	Rui Gomes				
University	University of Evora				
Thesis title (even tentative)	Smart instrumentation amplification techniques based on metaheuristic optimization algorithms and machine learning for gain setting				
Main aim of thesis	The aim of this thesis is research on new techniques for electrical signals gain amplification and attenuation, automatically and adaptively, relying on mathematical optimization and machine learning				
Green Competences	GC4; GC5; GC6; GC8; GC9				
Digital Competences	DC1; DC2; DC3; DC4; DC5; DC11; DC13; DC14; DC17				
Competence assessment	*Item count*	Green Comp	*5*	DigComp	*9*
Thoughts on the experience of transnational training	This training gave me a fresh perspective on how digital and green competences can enhance my research on smart instrumentation and adaptive signal gain. Exploring practical examples with peers from across Europe helped me see how machine learning and metaheuristic optimization can be applied in real-world systems. I also gained insights into using digital tools to make processes more efficient and adaptive, strengthening my skills for developing innovative, data-driven approaches in electrical signal amplification and control.				

THESIS-COMPETENCES SURVEY

TECSKILL - Relate your thesis to green and digital competences.

Thanks to this form, TECSKILL will be able to identify which green and digital competences are related to your doctoral thesis.

Obligatoria

1. Name and surname *

2. Choose your University *

- ◯ University of Extremadura
- ◯ University of Evora
- ◯ University of Parma
- ◯ University of Gävle

3. Thesis title (even tentative) *

4. Main aim of thesis *

5. Select the Digital Competences most closely related to your thesis. *

- [ ] DC1. Searching and filtering data, information and digital content
- [ ] DC2. Evaluating data, information and digital content
- [ ] DC3. Data, information and digital content management
- [ ] DC4. Interacting through digital technologies
- [ ] DC5. Sharing through digital technologies
- [ ] DC6. Engaging citizenship through digital technologies
- [ ] DC7. Collaborating through digital technologies
- [ ] DC8. Netiquette
- [ ] DC9. Managing digital identity
- [ ] DC10. Development of digital multimedia content for research purposes.
- [ ] DC11. Digital content integration and reelaboration
- [ ] DC12. Copyright and intellectual property licensing
- [ ] DC13. Programming
- [ ] DC14. Protecting devices
- [ ] DC15. Protecting personal data and privacy
- [ ] DC16. Protecting health and well-being
- [ ] DC17. Protecting the environment
- [ ] DC18. Troubleshooting technical problems
- [ ] DC19. Identification of technological needs and responses
- [ ] DC20. Creative use of digital technology
- [ ] DC21. Identifying gaps in digital skills

6. Select the Green Competences most closely related to your thesis. *

- [ ] GC1. Valuing sustainability
- [ ] GC2. Supporting fairness
- [ ] GC3. Promoting nature
- [ ] GC4. Systems thinking
- [ ] GC5. Critical thinking
- [ ] GC6. Problem framing
- [ ] GC7. Futures literacy
- [ ] GC8. Adaptability
- [ ] GC9. Exploratory thinking
- [ ] GC10. Political agency
- [ ] GC11. Collective action
- [ ] GC12. Individual initiative

7. Thoughts on the experience of transnational training *

GREEN AND DIGITAL SKILLS DEVELOPMENT FOR EUROPEAN ENGINEERING PHD CANDIDATES

This project has been funded with support from the European Commission. This publication document reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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Co-funded by
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