

## **R5.4 Roadmaps for HEI curricula**



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## Glossary of terms, abbreviations and acronyms

Abbreviation/ Acronym /Term	Description
<b>EQF</b>	European Qualifications Framework
<b>HEI</b>	Higher Education Institution
<b>TAMK</b>	Tampere University of Applied Sciences

Partner shortname	
P1-Campus Iberus	Partner 1 - Campus Iberus (Spain)
P2-Ecoembes	Partner 2 - Ecoembes (Spain)
P3-AGH	Partner 3 - AGH University of Science and Technology (Poland)
P4-Synthos	Partner 4 - Synthos Group (Poland)
P5-TAMK	Partner 5 - TAMK Tampere University of Applied Sciences (Finland)
P6-Pyroll	Partner 6 - Pyroll Group (Finland)
P7-Proplast	Partner 7 - Consorzio per la promozione della cultura plastica - Proplast (Italy)
P8-UNISA	Partner 8 - Università degli Studi di Salerno (Italy)

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### 1. Introduction

All plans are worth little until they are effectively implemented (Kotler, Haider, & Rein, 1993, p. 97). Achieving the planned objectives and strategies depends on how satisfied stakeholders are with the PackAlliance Programme being introduced in the universities. The implementation function of the Programme, also called the market placing function, consists in achieving the HEI curricula goals and implementing the adopted strategies of action by adapting and coordinating various educational tools. Additionally, the PackAlliance Programme, which takes into account, the nature and the potential of currently supplied education market and its offers, the perspective of external and internal processes, goals and strategies of the PackAlliance Programme, determines its implementation into the HEI curricula. As a result, the above process is matched to existing conditions and to the characteristic features of the current and potential HEI stakeholders. To consider the PackAlliance Programme implementation as a success, HEIs and industry Partners from four countries (Finland, Italy, Poland and Spain) participating in the PackAlliance project, have to subjugate strategies to the adopted goals. The condition for the achievement of the above-mentioned goals is collaboration between HEI and industry entities involved in the PackAlliance Programme 'providing' individual constituents of the 4 modules, and coordination of their activities as well as cross-border collaboration between national PackAlliance hubs and postgraduate programmes (Spain, Poland, Italy, Finland), driving a real dynamic network (CHAINS).

Thus, in order to make the right decisions, these entities responsible for the creation of the module should ask themselves whether the policy they implement is in line with the superior goals and strategies of the PackAlliance Programme. The entities mentioned do not create value (including value for the students) on their own. They do it within a network of relationships with other PackAlliance Programme players. Thus, PackAlliance Programme implementation into HEI curricula within four countries composed of different entities involves the adoption of cooperation concepts (network cooperation, network relations, cooperation, collaboration, partnership) based on value net i.e., the network character of the relationships between the entities that shape the PackAlliance Programme.

This ensures a rapid development and adaptation of the PackAlliance Programme to educational market expectations, a strategy recommended for building a competitive advantage that enables long-term market success.

The adoption of a student-oriented approach by the programme partners includes planning and designing a particular module in such a way as to successfully meet the needs of target markets and at the same provide the high-quality learning experience for beneficiaries. This is possible only when certain coordination processes are introduced in the PackAlliance Programme leading to the establishment of a partnership between HEIs and industry partners as well as within HEIs in Finland, Italy, Poland and Spain for its development. Joint efforts to create the comprehensive PackAlliance Programme in the form of an 'integrated experience' are accompanied by building relations and forging ties between the entities engaged that are not bound by hierarchies. These relations are a result of pursuing similar goals. In these circumstances, the development of the integrated and unified PackAlliance Programme and reaching a consensus on its principal vision and the direction of its development in such a diversified group of entities requires subordination of their objectives to superior objectives. To achieve this objective, it is crucial to integrate actions of all partners and to make a joint effort based on a network of entities involved as well as industry stakeholders who support the development of the PackAlliance Programme. The coordination of the above-mentioned efforts requires a major initiative led by one dedicated entity (e.g., cluster) to integrate the PackAlliance Programme. If all partners responsible for creating this programme are to take appropriate decisions, they should answer the following questions: Is the offered modules compatible with the programme's strategy adopted and implemented by the HEI curricula? Does the PackAlliance Programme take into account all suggestions regarding the targeted market? What should be the scope of the modules by the HEIs curricula? How should the PackAlliance Programme be promoted in the market? Only on this basis will it be possible to take decisions concerning the PackAlliance Programme (its modules range, differentiation, diffusion of innovations).

Among the factors that might differentiate the programme, one may enumerate:

- features (physical characteristics, e.g., qualifications), properties (functional characteristics, e.g., efficiency) and attributes (structural characteristics such as modernity);
- quality of the programme (organisation of learning, providing correct teaching methodologies etc.);
- differentiation of modules (syllabus) accompanying the programme.

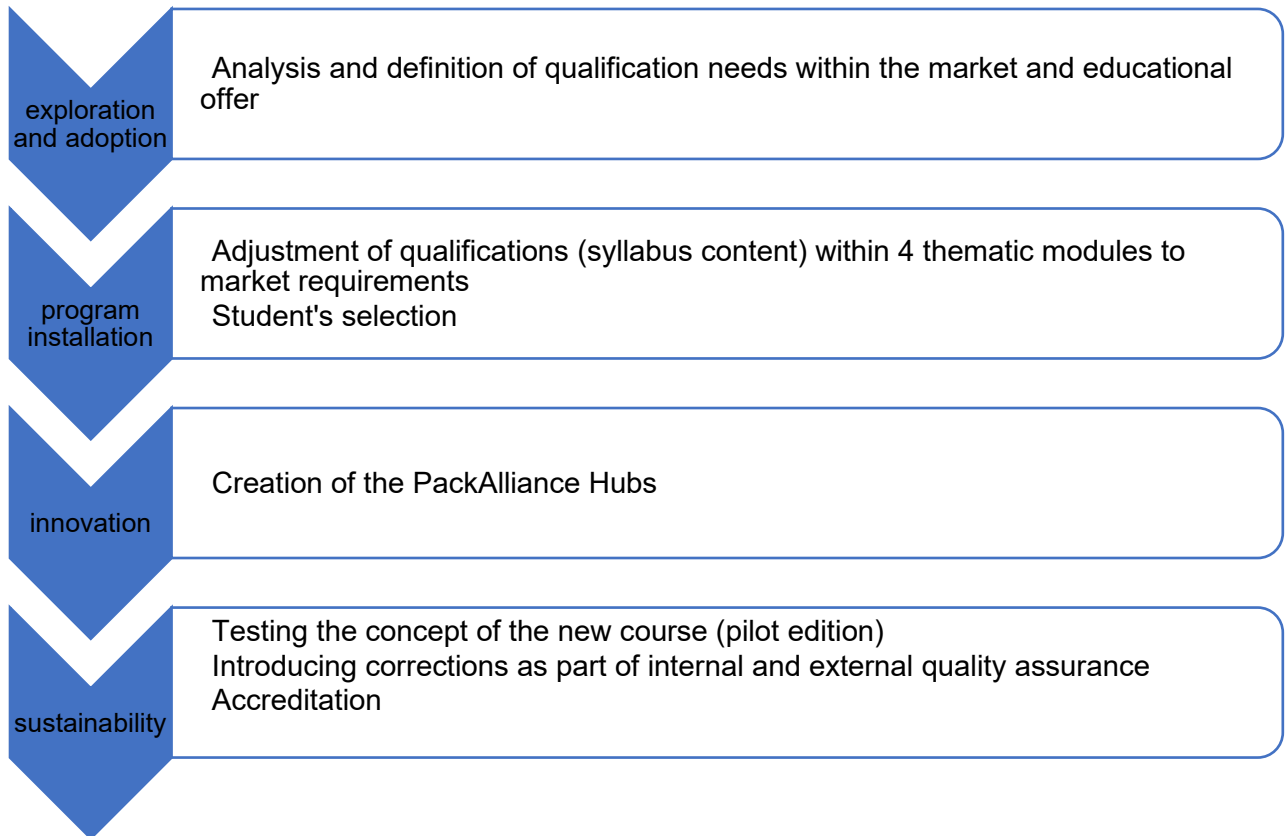
Consequently, the previously mentioned tools play a role in the PackAlliance Programme competitiveness and attractiveness in the educational market.

Attention should also be paid to the fact that implementation of the PackAlliance Programme's must be carried out not only from the point of view of economic profitability but must also include costs and advantages for the environment and society.

## **2. Key steps to take for PackAlliance Programme implementation into HEI curricula**

Implementation involves putting a plan into effect, including the process of monitoring progress, making adjustments, and evaluating impact. Implementation takes place in stages. Identified stages of implementation process for the PackAlliance Programme that efforts must address in order to be successful: exploration and adoption, installation, innovation and sustainability (Fig. 1). Thus, implementation contains few immediately actionable steps that can be directly translated into practice. These stages represent an iterative process, as efforts are reassessed or reevaluated in light of new realities.

**Fig. 1. Framework for PackAlliance Programme implementation into HEI curricula**



Source: own work

The purpose of this research and the analysis of qualification needs within the market and educational offer has been to make visible the lack of specific training on CE in the plastic packaging sector. Then an overview of candidate type who applied for the training programme is necessary. Once partner universities have identified those areas of qualification needs for learning that need to be addressed, they must adjust syllabus content within 4 thematic modules to CE market requirements. Universities from Finland, Italy, Poland and Spain that develop strong partnerships with industry stakeholders increase the potential for positive of the learning experience for students. PackAlliance Hubs created and coordinated CHAINS which ensure cooperation with the industry. PackAlliance Hubs are meant to be centers of educational, innovation and entrepreneurial excellence in Circular Economy for the plastics packaging sector.



These Hubs serve as a physical connecting space between High Education Institutions and companies in order to ensure further implementation of the Postgraduate Programme beyond the project lifetime as well as collaboration for exchange of good practices, innovation for new solutions and entrepreneurship for Circular Economy transformation within the plastics packaging value chain.

Collecting opinions of students and teachers about the course conducted within the framework of 4 thematic modules will help to assure internal and external quality of the PackAlliance Programme. Accreditation contains the required procedures and responsible entities to be followed in order to get accreditation of the PackAlliance postgraduate programme in each participating country, according to the European Qualification Framework (EQF) in order to ensure the recognition of the credential earned throughout the programme within the European Higher Education Area and beyond. A strong monitoring plan contributes to the overall safety and sustainability of the PackAlliance Programme.

### **3. Strategy for PackAlliance Programme implementation into HEI curricula**

In order to determine the strategy for the PackAlliance Programme implementation into HEI curricula ex-post SWOT analysis was conducted within three fields (staff, science, organisation) for 4 Modules led by Finland, Italy, Poland and Spain. Furthermore, suggestions for development of the programme in general as well as overall assessment of the student feedback for 4 Modules and suggestion for development were proposed.

### **3.1. SWOT analysis for adaptation of the PackAlliance Programme into HEI curricula for 4 Modules**

#### **Module 1 *New materials and biomaterials (led by Polish partners)***

##### **STRENGTHS**

###### ***staff***

1. What are the benefits of incorporating the PackAlliance Programme into HEI curricula?
  - The staff develop and impart knowledge about new materials and biomaterials.
  - Provides valuable theoretical and practical knowledge that will be used in implementing the goals of the circular economy.
  - Identification of different strategies and management tools for transition towards a circular economy in the plastic industry especially for new materials
  - The staff can learn about the realities and problems encountered in partner countries and can learn about possible solutions used there in the field of new materials and biomaterials in the plastic packaging industry
  - The knowledge can be shared thanks to cooperation between science and industry, especially small and medium enterprises due to translation materials to national languages.
  - The cooperation between AGH and Synthos providing and teaching new skills
2. What is the state of readiness of the infrastructure and the academic staff for introducing the PackAlliance Programme in your HEIs?

- The state of readiness of the infrastructure and the academic staff for introducing the PackAlliance Program in Poland is sufficient to conduct classes on new materials and biomaterials.
- There are lecturers and specialists in this field ready and willing to conduct classes in this area

### ***science***

3. What impact did the program have on improving students' qualifications?
  - The students have improved their qualifications in particular in the waste management area for new materials and bio materials, which are in line with circular economy rules
  - They have increased knowledge about technical, economic and social aspects of using and choosing new materials and bio materials in circular economy in the plastic industry
  - Through the collaborative work in the groups, and learning about different challenges in partner countries, students may have wider opportunities to use their knowledge of materials and biomaterials in their motherland regions
4. To what extent did the program improve students' qualifications?
  - The module on new materials and bio-based materials reviewed the issues related to the knowledge of the possibilities of using innovative materials, including biomaterials in the plastic packaging industry in the context of the development of the circular economy
5. Does syllabus reflect the content of the module?
  - The content of the syllabus complied with the content of the module about New and Biomaterials.

### ***organisation***

6. What are the current HEI strategies and policies that could aid in the introduction of the PackAlliance Programme into the curricula?
  - The program for the development of higher education and science is a response to the social, economic and civilization challenges in Poland. Thanks to the reforms, universities gained greater autonomy. They can create their own curricula and learning can be more flexible. Currently, universities and research units are more and more open to cooperation with local governments, other universities, non-governmental organizations and enterprises.
  - Also the main aim of the AGH University of Science and Technology in Krakow is the development of knowledge and the education of students in the national and international education space, the carrying out of scientific research at the highest level, and the efficient organisation in all areas of university activity [<https://www.agh.edu.pl/en/university/documents/translate-to-english-misja-statut-strategia/translate-to-english-strategia-rozwoju-agh/>] So, there is a possibility of introducing the PackAlliance Program into the curricula.
  - AGH is a research university where one of Priority Research Area is the New technologies for the circular economy: merging business models with eco-innovations to improve productivity and minimise waste, as well as to create knowledge and use it (PRA 2) <https://www.agh.edu.pl/en/initiative-for-excellence-research-university/priority-research-areas/>
7. What procedure aids in the PackAlliance Programme's implementation?
  - AGH University belongs to The European Universities Network
  - AGH University is a research university that combines science and industry

## **WEAKNESSES**

### ***staff***

8. What knowledge, skills, and competencies do the PackAlliance Programme lack in order to fit into curricula?

- PackAlliance programme works due the EQF5 rules.
- Training program focus on circular economy in plastics package issues, keep the focus there (some overlapping and topic of the theme),
- more circular economy and management aspects should be considered.

### **science**

9. What aspects of the PackAlliance Programme need to be improved in terms of its implementation?

- Too much material to prepare in a short time. It was troublesome for full-time workers or full-time students.
- Trouble in using the Teams platform - In Teams sessions, students can not discuss privately with other students - the chat functions work only if the teacher has made the groups
- No contact with the teacher (name and e-mail in the description of some tasks
- Inactive and active members both in random and set teams
- Less time for the presentation of each team
- More contact hours-preferable by the end of the week. Source [based on students' opinions [source: Moodle Platform Module 1 feedback survey]

### **organisation**

10. Is there a gap in strategy or policy that prevents the PackAlliance Programme from being integrated into curricula?

- PackAlliance programme works due to the EQF5 rules - The document about EQF5 Implementation was developed by e-learning center

11. What procedures are barriers to the implementation of the PackAlliance Programme?

- The requirements of new educational programs implementation at the University can be the barrier in the process of the implementation PackAlliance Programme.
- We are pioneers in implementing the PackAlliance Programme

- There are no good practices to which we can relate.

## OPPORTUNITIES

### **staff, science**

12. What are the PackAlliance Programme's assets in terms of market and stakeholder expectations?

- The program may be useful for stakeholders due to market requirements  
DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on reducing the impact of certain plastic products on environment introduced changes that require knowledge and skills in the field of circular economy, COM(2018) 340 final
- Road map of the circular economy- the priorities of Poland within circular economy belong: innovation, strengthening cooperation between industry and science, and consequently implementation innovative solutions in the economy, Bioeconomy "concerns the management of renewable resources (circular biological economy)"[source: Road Map Transformation towards Circular economy, <https://www.gov.pl/attachment/72d8cd08-f296-43f5-af28-21ab2fada40e>

13. What tendencies might be the assets for the implementation of the PackAlliance Programme?

- The details of implementing such programmes like PackAlliance are in the document Program, PROGRAM AUTONOMY OF THE UNIVERSITY
- Qualifications framework for higher education The project of the Ministry of Science and Higher Education "National Qualifications Framework in higher education as a tool for improving the quality of education"  
[https://brjk.amu.edu.pl/\\_\\_data/assets/pdf\\_file/0008/59435/krk.pdf](https://brjk.amu.edu.pl/__data/assets/pdf_file/0008/59435/krk.pdf)
- New business models require new offers from traditional educational institutions
- changes brought by the Fourth Industrial Revolution.

14. How might the extracurricular offer system within HEIs may aid in the implementation of the PackAlliance Programme?

- The necessity for the development of entrepreneurs and the increasing requirements for professionals
- proper advertisement of the offer

### ***organisation***

15. What policy/strategy changes can we predict, and what impact will they have on the PackAlliance Programme's implementation into curricula?

- Extending the educational offer of the university for people of different ages, students and professionals
- Strengthening the partnership of universities with enterprises
- A new typology of universities implementation

## **THREATS**

### ***staff, science***

16. What are the PackAlliance Programme's threats in terms of market and stakeholder expectations?

- There may be competition from educational institutions
- New educational offers may appear on the market, due to the growing interest in the circular economy, including topics related to the restriction of plastic and the use of new and biomaterials
- stakeholder expectations may become increasingly high

17. What are some of the unexpected requirements that HEIs may have to implement?

- The future requirements will be reflected the demand for lifelong learning. The educational offers will have to face technological and social changes
- Skills acquirement will be a key component in education sphere. For more information: Marta Ponikowska, THE EUROPEAN AREA OF SKILLS AND QUALIFICATIONS

[https://vccsystem.eu/wp-](https://vccsystem.eu/wp-content/uploads/2014/05/Europejski_obszar_umiejetnosci_i_kwalifikacji1.pdf)

[content/uploads/2014/05/Europejski\\_obszar\\_umiejetnosci\\_i\\_kwalifikacji1.pdf](https://vccsystem.eu/wp-content/uploads/2014/05/Europejski_obszar_umiejetnosci_i_kwalifikacji1.pdf)

- Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications
- “Explaining the European Qualifications Framework”, The European Commission, source: <https://europa.eu/europass/system/files/2020-05/EQF-Archives-PL.pdf>
- It will be necessary to transform educational models to market requirements at the same time keeping the relevance of the values of HE for the societal benefits.

18. How might the extracurricular offer system in HEIs obstruct the PackAlliance Programme's implementation?

- Offers may be more tailored to the requirements of stakeholders
- There may be many of them in the future

### ***organisation***

19. What policy/strategy might pose a threat to the incorporation of the PackAlliance Programme into curricula?

- More demanding requirements for the implementation of educational programs
- The PackAlliance program is in line with the management themes and strategy of the Faculty of Management (University of Science and Technology).

## **Module 2 Eco-design and novel manufacturing processing (*led by Italian partners*)**

### **STRENGTHS**

#### ***staff***

1. What are the benefits of incorporating the PackAlliance Programme into HEI curricula?



- Creation of new educational materials and implementation of new student-centered teaching methodologies, to prepare students to become experts in sustainable food packaging systems, with the skills for a conscious and critical choice of materials and production methods, for innovation and design of circularity solutions.
  - The implementation of HEIs-packaging enterprise networks at regional and European level promotes the adoption of educational approaches combining theoretical and practical knowledge, which help students become more effective problem solvers and professionals.
2. What is the state of readiness of the infrastructure and the academic staff for introducing the PackAlliance Programme in your HEIs?
- Unisa has adequate infrastructure and academic staff to implement the PackAlliance Programme into the curricula.

### **science**

3. What impact did the program have on improving students' qualifications?
- Packalliance Programme, thanks to the synergic cooperation of HEIs-packaging enterprise network, can promote in-depth and up-to-date specialist training in the packaging field with high technical potential, strongly oriented towards innovation, competitiveness, and sustainability, and focused on companies' needs.
  - The “student center approach” of the program can support students in building their career path according to their personal needs and expectations.
4. To what extent did the program improve students' qualifications?
- The program provides multidisciplinary competencies (technical, organizational, financial, and marketing) at an EQF level 5 for students of at least the first cycle approaching the labour market (including the last 2 semesters), or for experienced professional workers of packaging enterprises.
5. Does syllabus reflect the content of the module?
- Yes, the agreement is good.

### **organisation**

6. What are the current HEI strategies and policies that could aid in the introduction of the PackAlliance Programme into the curricula?
  - Unisa is part the Italian Network of Universities for Sustainable Development - RUS (Rete delle Università per lo Sviluppo Sostenibile) and promotes the inclusion of sustainability and circular economy thinking in its research and study programs. The autonomy of the Italian university system, in the context of the EHEA qualifications framework, allows to develop own curricula and learning courses also in cooperation with other universities, non-governmental organizations and enterprises.
7. What procedure aids in the PackAlliance Programme's implementation?
  - UNISA has an internal regulation defining in detail characteristics (including ECTS, duration, teachers' qualifications, admission requirements, funding, ...) and administrative procedure to design and activate post Higher Education courses (short courses, First-level and Second-level university masters, Specialization diploma).

### **WEAKNESSES**

#### **staff**

8. What knowledge, skills, and competencies do the PackAlliance Programme lack in order to fit into curricula?
  - Some practical coursework may not be digitally enhanced.
  - Educators may have competency lacks for implementing learner-centered pedagogical techniques into the classroom.

#### **science**

9. What aspects of the PackAlliance Programme need to be improved in terms of its implementation?

- Improvements should regard the following aspects: workload appropriateness, time scheduling, manageability by students of training materials.

### ***organisation***

10. Is there a gap in strategy or policy that prevents the PackAlliance Programme from being integrated into curricula?
  - Need to avoid competing with existing courses.
11. What procedures are barriers to the implementation of the PackAlliance Programme?
  - Need to find funding for the implementation of the programme.

## **OPPORTUNITIES**

### ***staff, science***

12. What are the PackAlliance Programme's assets in terms of market and stakeholder expectations?
  - The programme allows to train qualified professionals for the packaging sector with a strong multidisciplinary background, which integrates technical-scientific knowledge with the ability to analyse the sustainability needs of society and to promote the concept of circular economy in all stages of the packaging life-cycle, from cradle to grave.
13. What tendencies might be the assets for the implementation of the PackAlliance Programme?
  - Formation of high qualified professionals with competencies fitting the needs of different types of companies and organizations, public or private, operating in the packaging sector (e.g. packaging producers, printers, quality certifiers), especially for applications in the agri-food sector. These new professionals: have theoretical and practical knowledge for a concrete and in-depth approach to industrial problems and regulatory and sustainability aspects; have the capacity for innovation to promote competitiveness; and are able to develop

new strategies and solutions promoting the transition towards circular economy of the packaging industry/sector.

- Retraining of staff already employed with a higher level of skills, adapting them to recent technological, innovation and sustainability developments in the packaging sector.

14. How might the extracurricular offer system within HEIs may aid in the implementation of the PackAlliance Programme?

- UNISA regulations give the possibility to develop short educational programs and university Master courses for graduated (1<sup>st</sup> and 2<sup>nd</sup> level) students, even in cooperation with other Universities. In the last case an agreement must be signed by all the partners. The program must be structured - in terms of duration and ECTS - according to UNISA regulations, must be without costs for the university, and must be approved by the administrative organs (Department and Academic Senate).

### ***organisation***

15. What policy/strategy changes can we predict, and what impact will they have on the PackAlliance Programme's implementation into curricula?

- No changes can be currently predicted.

## **THREATS**

### ***staff, science***

16. What are the PackAlliance Programme's threats in terms of market and stakeholder expectations?

- Study time and workload appropriateness can be more balanced to fit better the working life demands of professionals. In terms of course content, the programme is well in line with the company demands for qualified professionals able to address innovation and multidisciplinary aspects of the packaging sector.

17. What are some of the unexpected requirements that HEIs may have to implement?

- The new curricula should be continuously adapted and updated - both in terms of course contents and EQF-level - to satisfy the needs of the rapidly evolving packaging sector. This process appears not easy, due to the administrative rules of HEI organization.

18. How might the extracurricular offer system in HEIs obstruct the PackAlliance Programme's implementation?

- Presence in the extracurricular offer of Master courses similar to PackAlliance Programme.

### ***organisation***

19. What policy/strategy might pose a threat to the incorporation of the PackAlliance Programme into curricula?

- In the present form the PackAlliance Programme does not comply with the Unisa regulations for the activation of post Higher Education courses.

## **Module 3 Residue Management and Valorisation (*led by Spanish partners*)**

### **STRENGTHS**

#### ***staff***

1. What are the benefits of incorporating the PackAlliance Programme into HEI curricula?

- The materials and educational contents generated within the module in particular as well as in the whole programme in general, will serve as a documental basis for the preparation of new training programmes within the several universities in Campus Iberus. The fact that the contents have been prepared considering innovative teaching schemes will add substantial value to the teaching materials.

The contents have been developed with a practical orientation, involving collaboration with private stakeholders. This is expected to promote the

development of new curricula considering the circularity of plastics from an applied and problem-based perspective that will improve the future development of graduates.

2. What is the state of readiness of the infrastructure and the academic staff for introducing the PackAlliance Programme in your HEIs?
  - Campus Iberus is participated by four different universities covering a wide range of curricular programmes. The staff and teaching/research facilities allow the development of future programmes related to the PackAlliance course. On the short term, the programme is expected to be implemented in courses related to Packaging Materials and their application in several sectors.

### ***science***

3. What impact did the program have on improving students' qualifications?
  - With no doubt the programme impacted the qualifications of the participating students. Most significantly in what pertains the application of knowledge and skills to address problems in real environments and to think using a critical approach. From a scientific perspective, it is harder to estimate an impact, as no indicators are available at this moment.
4. To what extent did the program improve students' qualifications?
  - The programme was developed to promote learning in a collaborative way and using cutting edge digital learning environments. It favoured not only the specific skills but also transversal aspects such as communication and digital skills.
5. Does syllabus reflect the content of the module?
  - Yes, both match well.

### ***organisation***

6. What are the current HEI strategies and policies that could aid in the introduction of the PackAlliance Programme into the curricula?

- Campus Iberus is a cluster of universities whose strategy is built on the principles of aggregation, specialisation and internationalisation, focusing especially on the areas of Agrifood and Nutrition; Energy, the Environment and Sustainability; Social Innovation and Territorial Development; Technologies for Health and Bioeconomy and the Circular Economy. These, in turn, are thematic priorities of the Smart Specialisation Strategies (S3) of the four regions where the Campus is located.

With the aim of creating knowledge ecosystems that foster excellence, cooperation and the efficient use of shared resources, Campus Iberus develops joint actions between its four universities in the areas of higher education and training, research and innovation, students, and internationalisation, which seek to impact its territory while having an international outlook.

7. What procedure aids in the PackAlliance Programme's implementation?
  - Each university within Campus Iberus has its internal regulations defining the development of novel curricula and the administrative and academic coordination of degree, master and other extracurricular courses.

## **WEAKNESSES**

### ***staff***

8. What knowledge, skills, and competencies does the PackAlliance Programme lack in order to fit into curricula?
  - Greater efforts should be placed in enhancing digital skills of teaching staff. Also, the project-based methodologies should be better implemented by training the involved teaching staff.

### ***science***

9. What aspects of the PackAlliance Programme need to be improved in terms of its implementation?
  - Improvements should consider a thorough reflection regarding the workload. Aspects pertaining the accessibility of some training materials should have

been also considered. Assessment criteria for different activities of even from different modules could be more homogeneous.

### ***organisation***

10. Is there a gap in strategy or policy that prevents the PackAlliance Programme from being integrated into curricula?
  - The EQF-level 5 studies are not suitable for B. Sc or M. Sc curricula in Spain. Therefore, parts of the programme can be implemented in the existing curricula but cannot be implemented as a whole.
11. What procedures are barriers to the implementation of the PackAlliance Programme?
  - The programme as it is needs to be adapted to fit in the existing curricula. The amount of ECTS is too high for allowing implementation in the existing curricula but too short for being developed as a self-standing official degree. So future development is required.

## **OPPORTUNITIES**

### ***staff, science***

12. What are the PackAlliance Programme's assets in terms of market and stakeholder expectations?
  - The programme can provide fundamental knowledge not just to students with a solid scientific and/or engineering background but also to professionals from other disciplines within the plastic production chain. This is a critical aspect when trying to address issues involving several stakeholders with the plastic value chain.
13. What tendencies might be the assets for the implementation of the PackAlliance Programme?
  - Training of future professionals to be hired by both public and private stakeholders to address complex challenging problems related to the circularity



of plastics. This is especially relevant within the agri-food sector, where Campus Iberus universities aim at becoming a reference institution, knitting collaborations with the plastics sector.

- Dissemination of the programme contents to professionals already working in companies and public bodies related to the packaging sector in order to provide new skills and training for facing the challenges related to sustainability in their daily professional development.
14. How might the extracurricular offer system within HEIs may aid in the implementation of the PackAlliance Programme?
- Short university extension and postgraduate courses are offered by Campus Iberus universities apart from those offered in the official curricula. The programme is perfectly suitable for continuous education addressed to professionals.

### ***organisation***

15. What policy/strategy changes can we predict, and what impact will they have on the PackAlliance Programme's implementation into curricula?
- EU and national Circular Economy strategies will most likely evolve in a way that will favour the implementation of the programme into HEI curricula.

## **THREATS**

### ***staff, science***

16. What are the PackAlliance Programme's threats in terms of market and stakeholder expectations?
- No major threats are identified. The programme is well in line with the demands placed by professionals and companies of the sector on specific courses that help to address the complexity of the subject at stake.
17. What are some of the unexpected requirements that HEIs may have to implement?

- As previously mentioned, there is a need for speeding up the process of adaptation of the new curricula to the already existing ones. There is a strong need for updating the courses with the new information generated and the way HEI are organised does not always facilitate this process.
18. How might the extracurricular offer system in HEIs obstruct the PackAlliance Programme's implementation?
- No systemic obstacles are expected.

### **organisation**

19. What policy/strategy might pose a threat to the incorporation of the PackAlliance Programme into curricula?
- Significant changes in the programme should be carried out to consider offering it as a postgraduate course.

## **Module 4 Citizen and Consumer engagement (led by Finnish partners)**

### **STRENGTHS**

#### **staff**

1. What are the benefits of incorporating the PackAlliance Programme into HEI curricula?
  - The PackAlliance training programme provides ready-made teaching materials that can be applied in several purposes. Additionally, teachers from several TAMK curricula can be involved in the programme. The knowledge of the programme can be applied in several multidisciplinary teaching teams at TAMK, and co-teaching can be applied. Also, reflection of teaching is possible to further improve the pedagogical aspects of the programme. The programme also further promotes sustainability through different novel teaching methods.
2. What is the state of readiness of the infrastructure and the academic staff for introducing the PackAlliance Programme in your HEIs?
  - No obstacles to implementation in terms of academic staff. The programme will be implemented as a smaller case / parts in the RimCE (Risk Management and Circular Economy) curriculum during the term 2022-2023. Parts of the

programme may be implemented, for example, during Packaging and New Products -course.

### **science**

3. What impact did the program have on improving students' qualifications?
  - No impact on improving students' scientific qualifications, no peer review knowledge was produced. [Note: Hard to assess students' qualifications as the starting level was not known and common measurable key indicators of improving students' qualifications were not used]
4. To what extent did the program improve students' qualifications?
  - The programme opens opportunities for a multidisciplinary work/skills, international collaboration with students from different European countries and provides skills also for distant working in multinational teams (digitalisation).
5. Does syllabus reflect the content of the module?
  - Yes

### **organisation**

6. What are the current HEI strategies and policies that could aid in the introduction of the PackAlliance Programme into the curricula?
  - The programme meets the TAMK strategy being the most international university of applied sciences in Finland, working life orientation, increasing circular economy and sustainability thinking in all studies and disciplines.
7. What procedure aids in the PackAlliance Programme's implementation?
  - The process of renewing the curricula at TAMK level.

## **WEAKNESSES**

### **staff**

8. What knowledge, skills, and competencies does the PackAlliance Programme lack in order to fit into curricula?

- In the PackAll pilot programme, the teachers from different countries did not communicate or share ideas together. The pedagogical development, that is one of TAMK's values and strategic choice, working life simulation scarce.

### **science**

9. What aspects of the PackAlliance Programme need to be improved in terms of its implementation?
  - Collaboration and leadership at the programme level. Building timetables, similar assessment criteria, monitoring of the progress.

### **organisation**

10. Is there a gap in strategy or policy that prevents the PackAlliance Programme from being integrated into curricula?
  - The EQF-level 5 studies are not suitable for B. Sc or M. Sc curricula in Finland. Therefore, the programme cannot be implemented as such as part of the curricula.
11. What procedures are barriers to the implementation of the PackAlliance Programme?
  - The programme as such is hard to fit in the curricula. 30 ECTS (European Credit Transfer System) is too large to be implemented in curricula changes. Parts of the programme can be used as they are modified to a certain EQF (European Qualification Framework) level (at least EQF 6).

## **OPPORTUNITIES**

### **staff, science**

12. What are the PackAlliance Programme's assets in terms of market and stakeholder expectations?

- Developing cooperation with different stakeholders offers opportunities to develop a new multidisciplinary understanding. Content benefits for example, trade, etc. professionals who are not experts in the field of plastics.
13. What tendencies might be the assets for the implementation of the PackAlliance Programme?
- Generation of a holistic view for a specific subject through examining the plastic packaging area from different perspectives. There is more need for these kind of skills as the multidisciplinary portfolio-professionals can solve the wicked problems creatively.
14. How might the extracurricular offer system within HEIs may aid in the implementation of the PackAlliance Programme?
- The PackAll training programme is feasible to be implemented in continuing education.

### ***organisation***

15. What policy/strategy changes can we predict, and what impact will they have on the PackAlliance Programme's implementation into curricula?
- EU policies are becoming stricter and there will be more need for this kind of education.

## **THREATS**

### ***staff, science***

16. What are the PackAlliance Programme's threats in terms of market and stakeholder expectations?
- As a trend, shorter and specific training courses are on demand. Alternatively, a more extensive programme can be implemented but with a longer study time to suit better for students from the working life.
17. What are some of the unexpected requirements that HEIs may have to implement?

- EQF-level, following the developing EU regulations in the field of plastic packaging to constantly provide updated information.
18. How might the extracurricular offer system in HEIs obstruct the PackAlliance Programme's implementation?
- Not foreseen.

### ***organisation***

19. What policy/strategy might pose a threat to the incorporation of the PackAlliance Programme into curricula?
- Not foreseen.

## **3.2. Overall assessment of students' feedback for 4 Modules and suggestion for development**

### **Module 1**

For the feedback questionnaire in total 31 responses were obtained for the Module 1. Overall, the feedback was neutral or positive. According to the student feedback the training contents were found relevant to the learning outcomes and the programme was helpful in upgrading student's skills.

The majority of students are pleased with the content and quality of the modules. They admit that the timing and workload of the Program are less favourable. Working in groups and different working styles of people from different countries should be included. Because each system has its own way of working, students are not used to some national requirements from different teachers.

The synchronous class should be organised in a different manner. Synchronous classes should be structured as a question-and-answer forum or discussion between students and teachers. Additionally, the class should be held on weekends for those who work. Students also recommend taking breaks between classes in order to devote more time to the project.

The workload of the programme was too much for the students to manage, even when compared to the normal study cycle. The tasks were too numerous and time consuming.

The module's content should emphasize technical rather than economic considerations. The students have varied educational and professional backgrounds. The Program should provide more information at the outset regarding the prerequisite knowledge required of applicants. The teamwork should be more efficiently organised. The students have diverse backgrounds and working styles; therefore, a more thorough analysis is required (we have to take into account that the module "new materials and bio-based material was the first one, and it was hard to manage which students are involved in the program). Instructions on how to use various types of tools should be provided. Some students are unfamiliar with tools like kahoot, teams, or moodle. As a result, an additional explanation should be included in the description. The meeting with all the teachers should be arranged. To learn more about their professions and backgrounds. The communication may flow more easily in this respect.

## **Module 2**

Module 2 had 43 participant students, 38 of them passed the module and 19 of them responded to the feedback questionnaire. Overall, about 80% of the respondents gave a positive or very positive feedback on the following questions: (1) the module met their expectations; (2) they were satisfied with the quality of the module; and (3) they would recommend the training module. More specifically, for what concern the contents, structure and training methodology, the training contents were found relevant to the learning outcomes and the programme was helpful in upgrading student's skills for almost all respondents (>90%). For about 80% of the respondents the module was well structured, with adequate time scheduled for each subject/task, the adopted training methodology was seen to fit for purpose, and it allowed a sufficient flexibility and autonomy. However, some students would have preferred more time-space for learning the large number of training materials and critical for thinking,

reflection, and creativity. Some of them, in written comments, would have appreciate a starting session to get to know each other and more interaction opportunities with the teachers, suggesting the incorporation of additional participatory tasks in the teaching methodology adopted in the Module 2. They also suggested to provide more videos or practical examples. The synchronous lessons timetable was seen more than satisfactory, even if in some cases the times of the contact lessons were not found to fit to the schedules of students coming from working life. The layout of the training contents on the Moodle platform was clear to all the students.

For the future editions, the courses can be optimized with a more appropriate amount of training material and workload, and additional videos, practical examples, and interactive tasks, to leave to the students more time space for free thinking, reflection, discussion with teachers and other students, and creativity and idea sharing. The timetable of the synchronous activities could be scheduled to better fit for the working-life students' commitments.

Part of the training material can be revised to improve its manageability by all the students.

### **Module 3**

The assessment of the impact of module 3 on the student's competences is positive in overall terms. Students provided a positive feedback of the contents of the module, which allowed them to increase consciousness regarding the complexity of the management of plastic residues, and how this fact affects the whole value chain. From their feedback, as well as from the contingencies encountered during the courses implementation, it can be concluded that some improvements are necessary for next editions.

These improvements pertain workload, redesign of some training contents to increase interactions between students and lecturers as well as within students, and a better scheduling for the assignment deadlines. Also the feedback to students could be improved in terms of including comments regarding their performance. This was done in some activities but not in all cases.



The majority of the students considered that the training contents were relevant to the learning outcomes of the third module (89,47%). The same amount of students showed satisfaction with the knowledge acquired in the module. 84,21% agreed that the module programme was helpful in upgrading their skills. Also a very high proportion of the students (94,74%) positively evaluated the methodology in terms of flexibility and autonomy allowed in learning the contents. Also a high proportion of participants was satisfied with the e-tools provided to carry out the module activities (88,89%), with the clarity and ease-of use of the e-learning platform (84,21%) and with the support in e-learning resources (84,21%). The overall perception of quality was also very positive (84,21% of the students). In all, a few students expressed their awareness about the acquired knowledge and the usefulness of the developed skills in a professional framework.

The rates of satisfaction were lower when the participants were asked about the workload appropriateness and the capacity of suiting the synchronous sessions with their daily duties. A 68,42% of the students stated that the workload was appropriate, and that the structuration of the module and time scheduling of the tasks was adequate.

The lowest scores pertained the suitability of the synchronous sessions (52,63% had a positive feedback) and the feedback received on their work (47,37%). However, when feedback on the students' work was provided, a 66,67% of the participants stated that it was useful. Also the supervision of the students' work by lecturers received a positive evaluation (73,68%).

In all, there were positive and negative comments raised by different students. Some students valued the structuration and clarity of the module. In comparison to previous modules, the workload was better valued, although it was suggested to offer the course on summer breaks. In the case of the negative comments, some suggested a new estimation of the duration of quizzes, as they demanded too much time. Although the module contents were generally well valued, a student asked for including a broader view of waste management approaches, considering case studies and

situation in different EU countries, as there are differences between northern Europe and Mediterranean countries.

There were also some complaints regarding the structuration of lessons and quizzes, as they were mixed together and sometimes this led to some confusion. This could be solved by better introducing the learning platform and the module dynamics to the students at the beginning of each course. Alternatively, learning contents and quizzes could be separated. As well, the time scheduling of synchronous sessions should be thought over.

#### **Module 4**

For the feedback questionnaire in total 15 responses were obtained for the Module 4. Overall, the feedback was neutral or positive. According to the student feedback, the training contents were found relevant to the learning outcomes and the programme was helpful in upgrading student's skills. The facilitation and teachers supervising and considering the needs of the students were highly appreciated. The adopted training methodology was seen to fit for purpose, and it allowed adequate space for free thinking, reflection, and creativity, as well as a sufficient flexibility and autonomy. In two of the written comments, it was suggested that the courses consisted too much group work and should have consisted more of independent work and quizzes. In the module of citizen and consumer engagement, teamwork was a clear pedagogical choice for the kind of activities implemented and for deep learning quizzes are not the method of choice. The choice and use of the new and participatory teaching methodology was one of the main goals in the whole PackAll programme. In the pilot implementation, for the Module 4 this goal was well fulfilled.

The training workload, the structure of the module and the schedules of the synchronous lessons were seen as least satisfactory. Especially the times of the contact lessons were not found to fit to the schedules of students coming from working life. The two courses conducted simultaneously caused confusion for some

respondents. The layout of the training contents on the Moodle platform was also not clear to all the students.

For the future editions, the time schedules of the courses can be designed to better fit for the working-life students' commitments. For the pilot programme, at the programme level timing of the contact lessons were set. The structure of the courses can also be developed for the future editions. Some students found the implementation of the two courses simultaneously confusing. It is possible to conduct the courses also sequentially. For example, the Citizen Engagement course might work e.g., in three four-hour workshops with introductions to the concepts, working and developing of roles for the role play, and small communication and idea sharing with other students. Individual tasks/assignments can be then done between the workshops. Student's own reflections for the assignments and the learning diary, for example, are helpful in assessing the impact of the courses in the students' competences.

The layout of the courses can be redesigned for the future editions. Using the Moodle Grids layout was a conscious risk which did not work that well in the pilot implementation. The Moodle layouts also differ in different organisations that may increase clarity of the contents. Some students found the materials unclear, and improvements can be done. For example, assignment "Circular Economy Concepts" introduces the students more with societal aspects of the circular economy. As for the pilot course, the assignment can be re-taken several times and does not count to the overall grading of the course. Merely, it encourages students to learn and test themselves rather than showing the teacher their knowledge.

### **3.3. Balanced scorecard for PackAlliance Programme implementation into HEI curricula for 4 Modules**

The strategic scorecard is currently one of the most modern methods of strategic management, which is effective in institutions providing public services (e.g. HEI). Strategic scorecard, also known as a balanced, integrated performance card was developed by Kaplan and Norton (2004) for the needs of the organization in order to effectively monitor the effects of the strategy implementation. The purpose of creating the Balanced scorecard was to translate the general wording of the strategy into strategic goals, tasks/activities, using a set of measures in four perspectives so that everyone could consciously contribute to the success of the organization (Table 1).

**Table 1. The concept of implementation and realization of the strategy for PackAlliance Programme implementation into HEI curricula for 4 Modules**

<b>Perspective</b>	<b>Strategic goals</b>	<b>Tasks/activities</b>	<b>Measures</b>
<b>Financial</b>	1. Increase in employment of specialists participating in the PackAlliance Program  2. Financing of CE courses at HEI from European programs	1. Establishing cooperation between HEI and the CE industry  2. Applying for funding to European programs	1. Number of students participating in the course  2. The number and efficiency of applications
<b>Customer and stakeholder</b>	1. Raising the professional qualifications of people participating in the PackAlliance Program corresponding to the needs of the economy, labor market and society	1. Issue of a certificate confirming professional qualifications in the scope of CE	1. Number of employees in the CE sector
<b>Internal process</b>	1. Increasing the quality and efficiency of education as part of the PackAlliance Program	1. Additional requirements for teachers and professionals	1. Number of participants 2. Level of participants' satisfaction

			3.Number of improvements
<b>Organisational capacity or learning and growth</b>	1.Launching an advertising campaign (press release, social media, university websites). 2. Extending the modules with new courses	1. Developing new employee skills	1. The level of stakeholder satisfaction 2.Expenditure on the purchase of new technologies 3. Expenditure on employee training 4. Expenditure on research and development 5. Number of new ideas proposed by employees

Source: own work

#### 4. Methodology for PackAlliance Programme implementation into HEI curricula

The creation of the PackAlliance Programme that corresponds to the declared needs and wants of the participants assumes that it will be implemented with the use of quality management tools such as internal and external quality assurance (Incarnato

& Garofalo, 2021), accreditation (Dryglas, 2021), assessment of the student feedback for 4 Modules (Module 1 - Czaplicka-Kotas, A; Module 2- Scarfato, P.; Module 3- Soliva-Fortuny, R.; Module 4-Hiipakka, M.) as well as strategic management tools such as education market analysis (Kulczycka, Czaplicka-Kotas, Iwaszczuk, Generowicz, Nowaczek, & Momora, 2020), SWOT analysis (Module 1 -Kulczycka J., Czaplicka-Kotas,A. & Muweis, J.; Module 2- Scarfato, P.; Module 3- Soliva-Fortuny, R.; Module 4-Hiipakka, M.) and Balanced Scorecard (BSC). Based on SWOT analysis and assessment of the student feedback Balanced Scorecard have been elaborated. It is the task of the consortium HEIs in Finland, Italy, Poland and Spain to integrate these tools in order to enhance effectiveness. Performance and quality comprise the efficiency in providing trainings from the beginning to the end of the process, and the degree to which the training satisfies students with respect to their needs and expectations (discrepancy between expectations of the student and service provider).

## **5. Summary**

Based on suggestions of each learning environment of the participating countries a Roadmap for the adaptation of HEI curricula to the tailored needs of market and stakeholders have been elaborated.

### **Suggestions for development of the programme in general**

For the overall coordination and guidance of all students participating the modules during the programme, a tutor is required in the future. During the pilot programme,

the responsibility of the students was split for the teachers in different modules which may also have impact to the engagement of the students to the programme. A single tutor would have helped in solving common challenges.

The programme should also have a common platform for a frequent communication of all teachers involved in the programme. In addition, organised team meetings for reflection of the teachers or at least teachers corresponding of the modules should be organised during the programme. During the pilot there was no reflective communication between international teacher teams. These could be organised by the coordinator/tutor of the PackAll training programme.

The programme should have a clear start and end e.g., a kick-off event and a final meeting, where all the students and teachers would take part. In addition, students need an orientation week (or period) at the beginning of the programme to get to know each other, get to know the rules and commitments of the studies, e-learning platform, and for example the common tools of the programme. This will build understanding of whole study programme and engage the students to the programme. Also, practicalities of the teaching activities, like team formation in the subsequent modules would ease up.

In addition, common get-together/meeting for all the students and teachers e.g., once during each module would be good to keep up the spirits and interaction. There everyone could freely communicate, ask questions, comment etc.

Feedback questionnaires for students to improve education should be partly redesigned to provide more information for pedagogical development. The feedback questionnaire for teachers didn't necessarily fulfil its purpose.

Harmonisation of the assessment for all the modules was suggested in the student feedback. For harmonising the assessment to be suitable for all the methodology and courses used in the courses, joint collaborative understanding among the project participants would be needed: to generate the unified view of conception of learning and teaching, what is evaluated and how, and how are competences addressed.

If the next edition of the training is to be a common European programme, well defined criteria, and deadlines as well as a unified processes (at the programme level) should

be developed for example, for missed assignments and re-takes of assignments. Possibility of taking only part of the programme (and not the whole 30 ECTS) should be decided. Clear decision of the time schedules of the programme and the modules must be given the students before the start of the programme. In addition, for example, if there will be some extra time between the modules, how and when the contact teaching is organised in different modules etc must be informed before starting the programme. This will help in the student orientation and engagement. On the other hand, the organisers need to have an idea/need to know, what kind of students are being targeted/sought for the programme and what kind of commitment is required of them.

The structure of the programme should be revised according to the different HEIs' requirements for its incorporation into their education offer and according to the European community law for the release of joint qualification recognised in European community.

Specific agreements among the partners should be signed to define the administrative and economic management aspects of the programme.



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