ADVANCING STUDY PROGRAMS AND CURRICULA WITH CONTENTS OF GREEN AGENDA, DIGITALISATION AND RESEACRH&INNOVATION AT UNIVERSTITES IN KOSOVA

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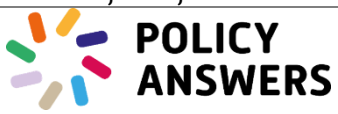
Supported by:	
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Abbreviations

EHEA-European Commission

EHEA-European Higher Education Area

EUA-European University Association

EU-European Union

HEI-Higher Education Institutions

ICT-Information and Communication Technology

KAA- Kosovo Accreditation Agency

MESTI-Ministry of Education, Science, Technology and Innovation

UASF-University of Applied Sciences in Ferizaj

UP-University of Prishtina

WB-Western Balkans

Executive summary

Higher Education Institutions (HEIs) are facing numerous challenges but also significant opportunities for improvement and advancement. Universities in the European Union (EU) countries are making continuous efforts to incorporate innovation and other priority areas of the EU. In this regard, the priorities of the EU agenda for the Western Balkans (WB), including research and innovation, green agenda, and digitalization, also pose serious demands for WB countries, particularly Kosovo. This report is an activity within the Horizon Europe project 'Policy Answers' and is compiled with the aim of contributing to raising awareness among HEIs and other responsible stakeholders to develop systematic activities so that HEIs in Kosovo can take the necessary steps in line with these global developments and demands.

Innovation in most study programs is integrated in specific fields with limited focus and is not adequately included in study programs. According to survey findings, respondents from HEIs indicate that the subject of innovation will be directly integrated and included in various fields such as urbanism and spatial planning, architectural design, architectural heritage, building performance assessment, monitoring and control, cryptography, and industrial engineering.

The elements of the green agenda are integrated only into programs or faculties directly or indirectly related to environmental themes. In other programs, green agenda elements are not adequately included. Exceptions are made by some programs, namely courses that have taken initial steps, according to survey findings. However, the challenge remains for students to acquire green skills demanded in the labour market.

Research methods are conducted across all HEIs programs. This subject provides knowledge for students on how to design studies, analyze data, and write papers, and so on. However, all evaluated syllabi lack interdisciplinary and practical approaches that would enable students to gain skills in addition to competencies for interdisciplinary studies.

Digital competencies are either weakly integrated or not integrated at all, except in programs within ICT related programs. According to responses from officials, key challenges in integrating digitalization into university programs include infrastructure deficiencies such as outdated equipment or laboratories, insufficiently qualified staff, inadequate adaptation to digital changes, and insufficient funds for digital tools investments. Some subjects in various programs do offer digital competencies that can prepare students for the labour market.

Several barriers affect the inclusion of thematic priorities in HEIs program syllabi. These include lack of funding for infrastructure, equipment, and laboratories aimed at integrating theoretical and practical parts, especially the lack of academic staff skills to lecture on topics such as: digitalization, innovation, and the green agenda.

Recommendations:

1. The curricula of HEIs programs should be interconnected with the thematic priorities of the EU and the EU Agenda for the WB through continuous dialogue with the private sector, policymakers, donors, and other interested parties, directly or indirectly involved. In this context, support structures for HEIs should be established not only to analyze curricula but also to respond promptly to the dynamics of labour market demands and needs.
2. Curricula should be developed and updated to incorporate the green agenda, digitalization, innovation, and applied research. These curricula should be designed considering their interdisciplinary nature, integrating various fields to help students acquire competencies and appreciate challenges from different perspectives.
3. HEIs, in collaboration with responsible stakeholders, should invest more in developing internal capacities such as: infrastructure and technology adoption to facilitate and accelerate the implementation of the said components. Continuous training for teaching staff is essential to develop additional teaching competencies, particularly in green topics, digitalization, and innovation.
4. HEIs management should pay greater attention to informing and raising lecturers' awareness about the importance of integrating the green agenda, digitalization, research, and innovation into study modules.
5. All HEIs should organize training sessions and workshops internally and in collaboration with each other to integrate the above mentioned fields into their programs and curricula. It is recommended to the Ministry of Education, Science, Technology and Innovation (MESTI) and donors involved in higher education to support such activities.
6. HEIs, research institutes, business associations, and other relevant institutions should collaborate to achieve more successful and productive integration of these components into the study subjects of HEIs.

   Within HEIs, particularly across all faculties and departments, there should be a multi-disciplinary and interdisciplinary approach aimed at incorporating these fields, namely the green agenda, digitalization, innovation, and scientific research, into their academic and research work.
7. There should be an increase in content and subjects related to innovation within curricula, not only in specific faculties but also in faculties where they can contribute to fostering national innovation and enhancing students' skills. This also contributes to creating an efficient innovative ecosystem, fostering a culture that encourages innovation and bringing significant benefits to society.
8. Syllabuses should be updated to include new topics in digitalization based on trends in technological developments. In this context, software and programming languages such as Python and R, visualization tools like Tableau or PowerBI, and virtual laboratories should be utilized.
9. HEIs should advance their content and curricula in research fields, not limiting it solely to modules on research methods or academic skills, but also involving students in research projects in collaboration with industry and businesses.
10. It is recommended that the National Council for Quality, namely the Kosovo Accreditation Agency (KAA), include these fields for further accreditation criteria and requirements for HEIs in our country.

1. Introduction

The adequate inclusion of content from the green agenda, digitalization, research and innovation in academic programs is crucial for the development of higher education in Kosovo. This stems not only from Kosovo's commitments and obligations regarding the implementation of these priorities within the EU agenda for the WB, but also because it is essential for Kosovo's successful integration into the European higher education and European Research and Innovation Area (ERA). Universities and colleges should incorporate contents from these fields into their research and teaching activities to provide a comprehensive educational experience that equips students with knowledge and skills to address complex challenges at both local and global levels. This is crucial for their competitiveness in the digital age and ready to contribute to the sustainable development of society.

The aim of this study is to contribute to improving the quality of university programs by enriching them with components from the green agenda, digitalization, research and innovation. In addition to providing information on the current situation, relevant recommendations are provided to serve all interested parties, especially governmental institutions and HEIs.

This report has been prepared as part of the activities of the Policy Answers Project (Horizon Europe) implemented by Riinvest Institute in Kosovo, within a consortium of institutes from the EU and the region. This activity falls under Work Package 3 (WP3), which includes specific actions related to "Supporting HEIs in reviewing and assessing how priority issues related to the green agenda, digital transformation, research and innovation are addressed in curricula, reflecting the strategic objectives of the EU agenda".

The EU prioritizes these fields to ensure a stronger global competitive position and achieve goals for a better quality of life and sustainable development. This research report focuses specifically on three components: digitalization, the green agenda, innovation and research. Previously, Riinvest Institute has published a report on healthcare issues and digitalization of this sector.

HEIs play a crucial role in addressing the strategic objectives of the EU. Among the actions of HEIs is the design of curricula programs that provide the required skills, aiming to accelerate the achievement of previously set strategic objectives. Integrating elements of the green agenda, digitalization, research and innovation into the curricula requires collaboration among policymakers, HEIs, the private sector, and experts as well. Studies highlight the importance of designing curricula and programs aligned with components of the green agenda, digitalization, research and innovation to support students in acquiring necessary skills (Jain et al., 2013; OECD, 2024; Reichert, 2019).

This report was compiled by analyzing: (1) Programs and syllabi published on the websites of public universities and private colleges in Kosovo; (2) Structured interviews with leaders and experts from these institutions; (3) Case studies of HEIs in the EU, selected on how they have implemented elements from the green agenda, digitalization, research and innovation, and one case study from a HEI in Kosovo. The current situation of the main universities in Kosovo was analyzed based on the list of the KAA. After selecting the list of universities, websites were initially scanned to see if syllabi were published. It is worth noting that syllabi from private colleges were not published on their websites, whereas only one public university has not published the syllabi.

To ensure the inclusion of HEIs and to complete the information, a questionnaire was designed and sent to HEIs in Kosovo. The questionnaire primarily focused on the extent to which elements of the

green agenda, digitalization, research and innovation are included in the syllabi of these institutions' programs. In total, sixteen respondents, including rectors, vice-rectors, and deans of HEIs, responded positively. The number of HEIs included in this phase was eight, consisting of four respondents from private and public sector HEIs.

The syllabi were analyzed based on a defined methodology based on studies in various countries. Firstly, keywords related to the green agenda, digitalization, research and innovation were identified. The number of evaluated HEIs programs included in the study was 79, comprising 51 at the Bachelor's level and 40 at the Master's level, with a total of 1,988 syllabi evaluated. Among HEIs, the University of Prishtina 'Hasan Prishtina' had the highest number of evaluated programs (49) and modules (462) at both Bachelor's and Master's levels, followed by the University 'Haxhi Zeka' with 14 programs and 368 syllabi.

Riinvest Institute expresses gratitude to the HEIs, their leaders, and educators for their collaboration in compiling this report. Riinvest would like to especially thank the European Commission, specifically Horizon Europe project, for supporting this activity.

2. Approaches and achievements in EU countries

The majority of HEIs in the EU have incorporated components of the green agenda, digitalization, research and innovation into their curricula to provide students with the necessary skills related to thematic priorities within the EU and its partners' engagements. This is driven by the need for students to gain knowledge and skills during their studies and to develop their abilities in response to the profound transformations expected through the implementation of the so-called dual green and digital transition, which are essential in meeting labor market demands and societal needs (VET Toolbox Coordination Hub, 2023).

It is crucial designing curricula that focus on interdisciplinary approaches in identifying and solving knowledge-based problems. Reichert's study (2019) shows the importance of the integrity of this interdisciplinary approach in curricula and teaching methods. This is highly important for implementing project-based learning and for connecting technological scientific disciplines and ensuring necessary connections between natural sciences and humanities in technological development. For example, the Master's program developed by an international consortium aims to combine ICT with fields such as the environment, economics, and social awareness. This program is designed to enhance students' abilities to adapt to the rapid development of new ICT technologies and to prepare them to acquire new knowledge (Klimova et al., 2016).

The European University Association (EUA) has provided guidelines for implementing the green deal, which consists of four components: i) research and innovation to foster multidisciplinary research aimed at supporting the implementation of green deal solutions; ii) education and students component focuses on interdisciplinary skills integrated within a new curriculum, allowing universities to adapt and offer trainings for staff and students to enhance their capacities; iii) staff and operations are committed to the implementation of the sustainable development strategy by addressing climate emergencies and increasing awareness of codes of conduct for staff and other actors to choose alternatives with lower emissions;; iv) public engagement and societal impact involves a clear vision for universities in implementing the green deal. This requires building trust with communities and

stakeholders, training for knowledge integration and study programs, promoting community and other stakeholders' engagement (European University Association, 2023).

The Danish Agency for Higher Education and Science has published a roadmap for integrating green agenda content into study programs at HEIs in Denmark, as part of investments in research related to green transition themes. This study report states that only 29 percent of study programs showed significant learning outcomes related to the green transition, with only 22 percent having at least one mandatory course on the topic, while 14 percent offered optional courses. The study highlights a challenge in distinguishing between green and non-green learning outcomes, emphasizing the need for clear definitions and strategic alignment to enhance competencies supporting innovation from the green transition (OECD, 2024).

Furthermore, the report identifies seven themes addressing societal challenges related to learning outcomes in this field. These include energy production, energy efficiency improvement, agriculture and food production, transportation, environment, circular economy, nature and biodiversity, and sustainable behavior and social consequences (Ministry of Higher Education and Science, 2024). The study conducted by the European University Association (EUA) has encompassed 372 HEIs across the European Higher Education Area (EHEA), which is currently in the process of implementing measures and initiatives related to the green agenda. Survey results suggest that 64 percent of institutions have activities related to the green transition underway, with 17 percent of these initiatives being department or faculty-based, while 14 percent of institutions plan to implement such measures in the future. According to Stöber et al. (2021), 80 percent of institutions consider green agenda topics highly important, integrating them into their extracurricular activities. About 94 percent have incorporated content into Bachelor's degree programs, and 79 percent into Master's programs. The majority, around 86 percent, believe that further curriculum reforms are necessary. However, these institutions have identified key challenges such as funding and academic staff shortages, difficulties in coordinating activities, and lack of strategic support.

Integration of digital skills into curricula is crucial for the 21st century. Digital competences in the ICT field can broadly be defined as 'the safe, critical, and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion, and/or participation in society' (Ferrari, 2012). More precisely, digital competences encompass the proper use of programs and technological devices according to the requirements of the environment where individuals operate (European Union, 2019). Digital competences are considered among the key competences for modern life and play a significant role in daily interactions (DeSeCo, 2005). The importance of possessing technological skills among workers, including familiarity with specific technologies such as artificial intelligence, big data, and cyber security, is expected to increase even further in the next five years (World Economic Forum, 2023). Digital competences should be included in university curricula due to the current importance and its increasing demand. According to research by Sánchez-Caballé et al. (2021), who analysed the syllabi of a university in Spain regarding digital competences, it turned out that technological knowledge is more integrated into technical programs, highlighting it as an important competence for future employees.

3. Initial Results in Enriching Study Programs in HIEs in Kosovo with EU Thematic Priorities

Based on the analysis of study programs at universities and faculties presented in Annex 2, as well as the responses in the questionnaire attached in Annex 3, it appears that except for research modules, the components of the green agenda, digitalization, and innovation are not sufficiently included. These components are primarily incorporated into specific programs, lacking an interdisciplinary approach. However, survey findings indicate that in the majority of HEIs, the process of revising curricula has begun in line with the thematic priorities of the European Commission (EC) and the EU agenda for the WB.

To integrate these thematic priorities, HEIs in Kosovo face various barriers, such as: (i) lack of infrastructure investments in laboratories and technology to facilitate the integration of thematic priority elements; (ii) lack of expertise and skills among academic staff to teach topics such as innovation, digitalization, and the green agenda.

3.1. Innovation in university programs

Currently, the integration of innovation in study programs is modest both in terms of content and volume. This constitutes one of the main challenges that higher education in Kosovo is facing. Efforts have recently increased to incorporate innovation into their programs, but there is still ample room for improvement and advancement. Within the framework of development and modernization of higher education in Kosovo, innovation has begun to be included in subjects and university modules. About 75% of participants in our survey confirmed that they have already introduced new subjects into their teaching programs, making innovation an integral part of the curricula, or have indicated that they have initiated discussions and are in the early stages of preparations. Innovation has been integrated into some subjects, mainly indirectly, including various fields such as: research and seminars, and courses in management and entrepreneurship. According to responses from relevant deans, innovation is directly included in subjects such as: urban planning, architectural design, architectural heritage, building performance assessment, control and monitoring, cryptography, and industrial engineering.

In addition to integration of innovation into subjects and modules, universities have expressed that they are undertaking various initiatives to incorporate innovation in other forms, such as organizing conferences on this topic, enabling students to take innovation subjects at partner universities abroad, and are as highlighted issues in the strategies of the universities. These efforts demonstrate a clear commitment to integrating best practices and the latest developments in the field of innovation.

Some of the most prominent barriers highlighted by participants' additional comments from survey begin with the idea that academic staff lacks necessary expertise in innovative technologies, and professional development opportunities may be limited. The small number of specialized professors in these fields and the lack of investments and capacities pose significant challenges. Infrastructure issues, out-dated equipment, and limited internet connectivity are unfortunately still present challenges in universities in Kosovo. This often results in resistance to changes within institutional culture, along with regulatory challenges that also impact the effective integration of innovation. This is further followed by financial constraints - insufficient funds and high cost of implementing innovation in curricula and programs.

In the context of conducting this study, we have analysed the syllabi and relevant courses to see if they contain any kind of innovation. Our analysis reveals that innovation has been integrated to a very small extent. These findings indicate that despite existing efforts, there is still a significant need for further improvements in this area. Although innovation may be discussed in classes in some contexts, there are no specific courses that include the word 'innovation' or directly related themes. The lack of integration of innovation in the courses is reflected in the fact that most of the course content is primarily based on presenting basic theories, lacking effective integration of innovation based on current trends. This absence of dedicated courses on innovation highlights a gap in current curricula that needs to be urgently addressed.

To initiate the integration of innovation into programs, it is essential to fully assess the current curricula of universities and identify areas that need revision. It is crucial for faculties, students, and other stakeholders to engage in discussions about which skills and knowledge are becoming increasingly important every day. The gap between what is taught and the needs of the modern workforce should be considered. This assessment needs to be comprehensive, examining not only content but also teaching methods and technological integration. Understanding these needs forms the basis upon which a more innovative curriculum can be built.

Interdisciplinarity and collaboration between faculties and departments is also a way to integrate innovation. Interdisciplinary approaches can stimulate creativity and offer students different perspectives. This may involve introducing new courses or revising existing ones to include new topics such as artificial intelligence (AI). The integration of AI into academic programs is crucial to prepare Kosovo's students for the global labour market and to foster innovation and research. For example, AI algorithms can personalize learning by adapting educational materials to each student's needs and learning style. This can significantly enhance the efficiency and effectiveness of education, helping students reach their full potential. Moreover, the inclusion of AI is a key component in implementing the green and digital agenda.

The lack of innovation as a separate subject or as a topic within other subjects can be linked to the availability of specialized personnel in innovation and the enrichment of these competencies. Furthermore, the absence of innovation subjects in HEIs is concerning given that innovation is a critical factor for both short-term and long-term economic development of the country. In some cases, even though there were no dedicated innovation courses, they were linked to other topics. However, despite the low percentage of these courses, what is concerning is the extent to which these limited subjects can help students gain innovation skills.

A possible consequence of the lack of more innovation subjects in HEIs may be that students are less likely to become entrepreneurs and develop innovative ideas. Another reason why integrating innovation subjects into HEIs is important could be that it creates innovation to build an efficient innovation ecosystem, leading to a culture that encourages innovation at all levels of the institution, resulting in greater benefits for society.

BOX 1: Technical University of Munich (TUM): Encouraging Innovation through Institutional Development and Curriculum

At TUM, teaching is primarily project-based. This is complemented by lectures on innovation and entrepreneurship to raise awareness about opportunities and challenges. These include topics such as intellectual property and business creation, often presented by successful entrepreneurs. Events highlighting the innovative beginnings of startups are held to promote entrepreneurship, and all entrepreneurial initiatives are supported, including those led by students like TUM's Business Plan Competition. TUM promotes an innovation culture throughout a student's career, encouraging them to test new ideas, maintain a positive attitude towards failure, and offering a wide range of courses exploring innovation processes. The Center for Digital Technology and Management (CDTM) provides practical experience through real-life projects, encouraging interdisciplinary collaboration, cultivating essential innovation skills, and generating student businesses.

Several institutional prerequisites are considered crucial to ensure the desired flexibility and adaptability to innovation needs. These include: i) a robust research base supporting innovation and project-based learning; ii) student-staff relationships based on individual support and mentoring in such project-based learning processes; iii) intensive interaction with industry and other interested parties to allow access to real-life issues for project work, as well as external mentoring and teaching staff; iv) governance allowing modular and flexible course organization; v) communication and collaboration across different disciplines and faculties.

Institutional characteristics that are considered important include: i) short joint courses, with flexibility to combine various themes in different programs and treatments; ii) a pedagogical training and innovation center, which can provide regular updates of academic staff training and teaching methodology support, including project-oriented teaching integrating various disciplines and departments; iii) professional curriculum development, with university teaching staff based on an initial assessment then prototypes are developed and presented in a workshop and they are modified after the initial feedback, marketing - where students of marketing look for course markets in distance, as part of their curriculum, and academic approval in the Senate, and regular evaluation.

Source: Reichert (2019)

3.2. Green agenda in university programs

The green transition of universities is understood as an increase in awareness and the implementation of concrete actions towards a green, environmentally friendly university with efficient resource utilization (Stöber et al., 2021). Integrating 'green' themes into curricula is crucial as it enhances awareness and provides a good opportunity to creatively address problems and challenges (Jabbour et al., 2013).

'Green themes' in HEIs are mainly focused on certain faculties and programs, while they are not included in other faculties. The lack of interdisciplinarity is evident across all curriculum plans and university programs. 'Green themes' demand interdisciplinarity, so integrating these themes with an interdisciplinary approach would have a greater impact, not only in increasing awareness among students but also in integrating different disciplines within these programs. Currently, based on syllabi

analysis, programs are 'rigid' regarding the opportunity for interdisciplinarity, which does not allow students to be adequately exposed to the green transition.

The findings of syllabi analysis align with survey results. Representatives of HEIs indicated that 'green themes' are addressed in specific programs, lacking a comprehensive approach across all programs. This is because integrating these themes into the curriculum requires cooperation and coordination between programs and departments, the development of clear methodologies, and defining the skills and competencies related to green transformation that students should acquire. Consequently, focusing solely on specific programs has a negative impact on expanding students' knowledge and skills, does not contribute to creating new knowledge, and does not provide new insights for a sustainable future in line with strategic objectives of the green agenda.

Another finding is that even though green transition themes are evident in certain programs, these often encompass topics in general terms that are not specific and clear. Consequently, this does not reflect in the development of practical skills and competencies based on real-life examples related to environmental challenges. For example, some programs include themes related to technology, but these themes are not integrated with the challenges of green transition that would enable students to understand how the use of technology could help to solve real problems.

The lack of integration of competencies from the transition and agenda into curricula across disciplines has its consequences, as it could represent a missed opportunity for multidisciplinary collaboration to address these issues. This is related to the complexity of the green agenda, which includes not only 'green themes' but also the adoption of new innovative and digital technologies to tackle these complex issues. Therefore, by analyzing these curricula and survey findings, we see that students are limited in terms of exposure to interdisciplinarity and the variety of solutions that can be applied to address environmental issues. Thus, is necessary focus that would reflect in increasing student awareness and offering creative ideas in solving various environmental problems in the country. Furthermore, the courses do not clearly differentiate in terms of learning green themes versus general topics. This implies that linking these themes would enable students gain "green skills", and therefore meet the labour market demands that is expected to become important.

In the survey findings, important topics such as: circular economy, decarbonization, environmental pollution, renewable energy, food security, and biodiversity within HEIs present a fragmented picture. These are not part of a comprehensive and integrated curriculum; instead, they are often isolated in specific programs or as part of individual courses within natural sciences. For instance, the circular economy is integrated only in three HEIs: the Faculty of Economics at the University of Prishtina (UP), the University of Applied Sciences in Ferizaj (UASF), and RIT Kosovo. However, these efforts are limited and do not sufficiently address the need for a broad and interdisciplinary treatment of this theme. Meanwhile, environmental pollution and renewable energy are primarily addressed in specific contexts such as sustainable development, lacking a systematic approach that would include these issues across all relevant disciplines. Environmental pollution, despite its importance, is mainly included in some natural science programs and less so in others, reflecting a narrow approach. Conversely, renewable energy is covered in sustainable development and business management programs but not comprehensively in construction, engineering or entrepreneurship.

Food security and biodiversity are two critical areas that have not yet found their place in current educational programs, except for future accreditation plans. This indicates a lack of adequate preparation for students to address the complex challenges related to these topics. Biodiversity,

which is essential for ecosystem preservation, is addressed only in narrow contexts such as urbanization and spatial planning, leaving a considerable gap in environmental education.

Environmental related themes, although addressed in some programs, indicate a clear need for deeper and interdisciplinary integration. This can be achieved through a comprehensive approach aimed at adequately preparing students to tackle global challenges related to sustainable development and environmental protection.

In the example provided below, we observe the particular focus that 'green solutions' have in curricula, including various courses directly and indirectly related to green themes. This has provided students with opportunities to analyze issues from different perspectives and offer real solutions to problems. Within this framework, interdisciplinary collaboration and offered projects enable the development of interdisciplinary skills among students to address environmental challenges more effectively.

Another important aspect is the focus on specific and practical skills offered by the program. This is achieved through the development of practical skills in the field of green transition. Finally, close collaboration with industry and the practical application of knowledge gained by students is a valuable opportunity. This is done by encouraging real projects developed in collaboration with academic staff, students, and businesses to provide concrete solutions for businesses.

BOX2: University College Nordjylland (UCN), Denmark: Designing programs according to green solutions

University College Nordjylland (UCN) has developed a program focused on green solutions, expanding the number of courses related to energy production, efficiency, environment, circular economy, nature, biodiversity, sustainable behavior, and social impacts. By recognizing the importance of green transition in construction, UCN integrated green elements into its curriculum from the first year through interdisciplinary projects and optional courses. The program prepares students for labour market challenges by requiring green elements in their projects.

Contents from the green transition in education: The program includes semester-long interdisciplinary projects, starting with designing a detached house and progressing towards an apartment. Mandatory practical work also includes green elements in all subjects and projects, demonstrating how students enhance their knowledge, skills, and competencies in green transition over time.

A wide range of green solutions offers students numerous opportunities during and after their studies. The program aligns with all 17 UN Sustainable Development Goals, including clean water, climate adaptation, sustainable energy, responsible consumption and production. The curriculum evolves with trends and new knowledge, supported by Molio - a recognized center of knowledge for construction industry. The program also includes CLT (Cross-Laminated Timber) training for building solid wood floors, integrated into education.

Learning outcomes for green themes for students: Academic staff emphasizes climate adaptation's importance, motivating students to contribute towards solutions. Most focus is placed on green transitions, including material circulation, reuse, recycling, life cycle analysis, sustainable materials, and green concrete, especially in optional courses and graduation projects. Students gain skills in energy design, life cycle assessment, renovation, sustainable materials, and learn digitalizing construction processes, strategy, and management. For example, they study roof tiles with integrated solar panels and learn life cycle analysis, evaluating material reuse, transportation, and climate impact. When designing a detached house, they realize that double-baked bricks require twice as much energy as regular bricks.

Students learn to manage green construction processes to meet increased demands for sustainable construction. They are trained using flexible collaboration methods and managing materials, processes, energy consumption, and building usage according to the latest CO_2 emission standards. The goal is to ensure buildings are as green as possible with minimal CO_2 emissions throughout construction and use. Students also learn to identify profitable green business cases, emphasizing resource criticality, analytical skills, and economic and climate impact. This preparation allows them to promote green adjustments to the workforce, demonstrating green transition benefits to producers and contractors.

Contribution to green transition: Upon graduation, students can contribute to the green transition with real construction projects. The university closely collaborates with We Build Denmark (WBD), which describes itself as 'a new meeting point for everyone in the construction industry seeking knowledge, innovation collaboration, green transition, and new technology.' WBD and UCN are in early stages of linking companies facing green transition challenges with students who attempt to solve them in their final projects. It's a win-win for both parties.

Source: Denmark's Evaluation Institute (2022)

3.3. Digitalization in university programs

According to the survey conducted with officials from the University of Prishtina and other HEIs, it is evident that the process of incorporating courses related to digitalization has begun. According to responses from officials at the University of Prishtina, digital elements are integrated into computer science programs and are also represented in other programs through specific courses such as: Digital Economics, Applied Informatics, Programming, GIS, Cartography, Digital Production, Web Application Development, and others; in line with the findings from our analysis of published syllabuses. A new insight from a response by an official from an HEI regarding digitalization is that certain programs in health sciences have also integrated technologies such as Virtual Reality (VR) into specific courses.

According to survey results, perceptions among officials regarding challenges or barriers were nearly identical for public universities and other HEIs. Key challenges identified include lack of sufficient funds and investments, inadequate technical-digital equipment, lack of digital skills among academic staff, and uncertainty about changes in digital developments. Additionally, according to officials from other HEIs, digitalization is viewed as an element through which appropriate engagement with contemporary global challenges can be achieved.

From a general analysis of Bachelor and Master levels at the University of Prishtina, it emerged that digital competencies are either weakly integrated or not integrated at all, except within faculties offering technical programs. Among the faculties included in the analysis regarding digital competency at the University of Prishtina are the Faculty of Economics, Faculty of Mathematics and Natural Sciences, Faculty of Medicine, Faculty of Law, Faculty of Philosophy, and the Faculty of Architecture.

As for digital competence, it is integrated to a limited extent at the Faculty of Mathematics and Natural Sciences, except in specific programs offered by this faculty. Among the programs with the highest integration of digital competence in this analysis, the Computer Science program, respectively, the Financial Mathematics Program was found. In these programs, the digital element is expressed through teaching of digital theory basics, computer architecture, operating systems, programming languages, algorithms, and their implementation to create applications or software as part of study projects. Additionally, these programs include courses that offer knowledge in software for data processing and analysis, understanding concepts related to databases, as well as programming languages for their management, visual design software, and familiarity with technologies and concepts such as E-commerce, Artificial Intelligence, Cyber security, and Internet of Things. Apart from knowledge and learning of digital tools, in other programs at the Faculty of Mathematics and Natural Sciences such as Chemistry, Chemical Engineering, and Ecology, where digital competence is recognized, it is mainly expressed through familiarization with the use of geo-navigation devices or spatial measurements, understanding instruments for measuring physical-natural phenomena, using software for data analysis and interpretation, project management software, and understanding the use of the internet for extracting information.

Regarding the Faculty of Architecture, the digital component is expressed in certain courses primarily related to teaching and using design software such as: CAD software, spatial measurement software, and various programming languages for data. It should be noted that courses in this field that did not have a digital character did not integrate digital competence into their syllabus at all.

On the other hand, at the Faculty of Philosophy, only courses in the Master's Program in Philosophy were accessible on its website. The analysis revealed that the element of digitalization was lacking in the majority of courses, and in one of the courses where it was more present, the focus was mainly on theoretical knowledge and global impacts of its use.

Similarly, at the Faculty of Education, most courses lacked digital competence, except for specific courses. Distinctive features of this faculty regarding digital competences were certain courses that included theoretical aspects of distance teaching.

The Faculty of Medicine was another faculty where the digital element was present only in specific courses. At this faculty, digital competences were predominantly expressed through teaching and using medical digital devices. Among the mentioned devices are those related to disease diagnostics such as digital radiological and ultrasound devices that display images. In other courses, such as those that focus on statistical and informatics content, there was an emphasis on using software for data processing and analysis, basic knowledge of application software, basic internet utilization to obtain information, and in specific courses, theoretical knowledge on robotic surgery. It is noteworthy that in the pharmacy program of this faculty, there are courses where students are introduced to specific software for modeling chemical structures, nanotechnology, using artificial intelligence in the pharmaceutical field, and gaining knowledge into identifying relevant databases.

At the Faculty of Economics at UP, digitalization is evident in specific courses such as: informatics, statistics, econometrics, and particularly in this faculty, there has been inclusion of contemporary technological concepts such as Artificial Intelligence, Blockchain, Machine Learning, E-Marketing, the use of social networks, and digitalization in finance. The concept of database basics is also expressed in specific courses where analysis and modeling are required, utilizing specific software and learning programming languages like Python or R used in the field of data. However, despite adequate participation in certain digitalization courses, overall, there is low involvement across all programs of the faculty.

Furthermore, at the Faculty of Law, digital elements were largely lacking in most courses, where the use or teaching of software has not been present. However, in one course at this faculty, there has been adequate integration of digitalization, expressed through teaching software for data grouping and interpretation.

BOX 3: University of Warsaw: Encouraging analytical skills independent problem solving

At the University of Warsaw, recent initiatives complement traditional teaching by promoting independent, group-based, and project-based learning. These programs systematically develop analytical and problem-solving skills while fostering entrepreneurial attitudes through initiatives, self-organization, and group work. Encouraging creative thinking to motivate students to think independently and apply analytical skills to problem-solving. Additionally, these programs aim to increase the attractiveness of the programs and improve graduate employment.

At the Master's level, in the course 'Ideas and Informatics' designed for mixed groups of students in computer science and other fields, the aim is to convey a wide range of innovation. Participants propose ideas, discuss them from different perspectives, propose skills that contribute to further development, and then form teams to develop a project idea that can be implemented in practice. Thus, students go through the process of addressing economic challenges, questions, steps, and market analysis. In the end, they submit a business proposal, after which a small number are selected for further development.

The program includes lectures and workshops led by small business managers. Although the program is still in its pilot phase, the success of its graduates is already evident: the first group of 700 graduates offered an unusual profile, combining analytical understanding of human cultural contexts with ICT skills and interdisciplinary awareness of issues - which proved highly attractive to companies. Strong student demand also shows how attractive such important professional experiences are in theory-based university curricula

The Faculty of Computer Science has introduced an optional program at the Master's level to raise awareness of economic demands and business challenges among computer science students; or the Humanities in New Technologies program or challenging projects at the Faculty of Physics that promote independent problem-solving skills.

Source: Reichert (2019)

3.4. Research in HEIs programs in Kosovo

Scientific research is a fundamentally important activity that serves as the basis for technological, economic, educational, cultural, and overall social development of a country. Unfortunately, Kosovo ranks at the bottom among WB countries in terms of the development of the scientific research sector. Consequently, it also remains last in the region in terms of economic development.

Since 1999, the research sector in Kosovo has primarily developed sporadically, without sustainable support from adequate funds and a clear development vision from the Government of Kosovo. The first post-war strategy for this sector, the National Science Program in 2010, largely remained unimplemented. The more recent strategy, the National Science Program (2023), despite increased budget and ambitions, has been criticized for its drafting process, lack of adequate public discussion, and for prioritizing major projects without a comprehensive development vision and so on.

In this context, efforts by HEIs in Kosovo regarding the research sector have not been particularly inspiring or supportive. Under these circumstances, HEIs, have primarily focused on teaching, while research activities have been neglected, namely as activities of enthusiastic individuals.

An illustrative example of this is the University of Prishtina, the largest and most dominant HEI in the higher education scene in Kosovo. Despite having the largest number of active or potential educators and researchers in Kosovo, the institution's statute still needs advancement to support the scientific research of its teaching staff. Currently, these educators are not incentivized financially nor are their teaching hours reduced for their engagement in research projects. Therefore, when discussing the integration of research in HEIs in Kosovo, we are primarily talking about the level of inclusion of this segment in the developmental priorities of the EU in the curricula of universities and colleges in Kosovo. The aim is to prepare students of these institutions with the necessary knowledge and skills for research and academic writing.

Based on the analysis of various university and college programs in Kosovo, almost all of them include at least one module on research methods or academic skills for undergraduate students. In most cases, these modules are evaluated with 6 ECTS credits, although sometimes they may vary:

1. Faculty of Architecture at UP offers a research methods module evaluated with 4 ECTS.
2. Faculty of Civil Engineering at UP includes a module related to this profile evaluated with 6 ECTS.
3. Faculty of Philosophy at UP evaluates its research methods module with 7 ECTS.
4. AAB College has a module titled 'Scientific Research Methods' evaluated with 8 ECTS.

Regarding the emphasis that some HEIs in Kosovo place on research, particularly in preparing their students with the knowledge and skills for conducting research, our interviews have highlighted specific modules dedicated to research methods across different study levels or programs:

- A representative from the former AUK or RIT in Kosovo listed four modules on research methods that students of this HEI pursue in various study levels[1].
- Similarly, a representative from the Faculty of Philosophy at UP mentioned three different modules on research methods in their responses to our survey[2].
- Almost all study programs at the University of Applied Sciences in Ferizaj include one or two modules related to research[3].

4. The University of Applied Sciences in Ferizaj (UASF)

The University of Applied Sciences in Ferizaj (UASF) is presented as a case study based on its program structure, which integrates social sciences and technical-technological aspects with substantial room to include thematic priority areas addressed in this report. Furthermore, the institution stands out for its commitments in green agenda inclusion, digital transformation, research, and innovation within its Bachelor's and Master's study curricula.

Firstly, the character of studies at UASF, as suggested by its name, emphasizes preparing students to apply acquired knowledge in relevant industry fields. This focus has led UASF to pay special attention to connecting theory with practice, particularly research and innovation.

[1] Responses in the Riinvest Institute survey.
[2] Responses in the Riinvest Institute survey.
[3] Example: Statistics, Statistical Models, Research Methods, Academic Skills.

Consequently, UASF has implemented the inclusion of green agenda, digital transformation, research, and innovation in its academic programs more systematically and comprehensively than most other higher education institutions in Kosovo.

4.1. Analysis of study programs and syllabuses

UASF has five faculties, with each study program aimed at addressing the labour market needs for qualified professionals in industry and business sectors. These faculties include: **1. Faculty of Management, 2. Faculty of Engineering and Computer Science, 3. Faculty of Architecture, Design, and Wood Technology, 4. Faculty of Tourism and Environment, and 5. Faculty of Applied Arts.** Within the Faculty of Management, the undergraduate program in Business Management and Entrepreneurship has been opened. This study program has 41 modules, of which 33 are compulsory and 8 are elective.

The green agenda is adequately integrated into two modules dedicated to this issue, while partially integrated into four other subjects[4]. Digital transformation is adequately integrated into five modules, with partial integration into six others. Student preparation for research is appropriately addressed with a dedicated subject, and partially integrated into three (3) other modules. Innovation issues are adequately integrated into four (4) modules of this study program, with partial integration into eight (8) others as either components or added value to the main module themes.

So, in 32 out of 41 modules of the Management Faculty program at UASF, the green agenda, digital transformation, research, and innovation are integrated adequately or partially. However, in the syllabuses of the remaining nine (9) modules, there is no trace of integration or attention towards these priority components of the EU agenda for the development of economies and contemporary European societies.

The first study program, Industrial Engineering with Informatics, includes 42 modules. The green agenda is adequately integrated into two (2) of these modules, while partial integration is observed in another module. Clearly, more attention in this study branch has been given to the issue of digitalization, which is adequately integrated into nine (9) modules and partially in three (3) others. Research is adequately integrated into a specific subject, while partially integrated into two (2) other modules. Similarly, innovation issues are adequately integrated into one (1) module and partially in two (2) others. As evident, only 21 modules of this study program adequately or partially integrate the European agenda priorities related to these themes. Conversely, in the other 21 curricula of modules, there is no articulated focus on these four (4) developmental priorities.

The other study branch of the Faculty of Engineering and Computer Science, Applied Informatics, consists of 41 modules. None of these modules integrate the green agenda, not even partially. Significant attention in this study direction has been given to digitalization, which is adequately integrated into 23 modules. Research is adequately integrated into two specific modules, while partially integrated into another subject. Similarly, the situation is with innovations, which is adequately integrated into one module, and partially integrated into another.

[4] 'Adequate integration of any of the four mentioned priorities of the EU agenda is considered when a specific module is dedicated to that component, while partial integration refers to when this priority is included or permeates a specific module as an added value'.

The undergraduate program, Interior Architecture and Furniture Design, consists of 41 modules. The green agenda is adequately integrated into one module, while partially integrated into two others. Digitalization is adequately integrated into three modules, while in nine other subjects, this integration is partial. Without a specific module for research methods, research issues are partially integrated into only two modules. The situation appears more favorable concerning innovation issues, which are adequately integrated into two modules and partially integrated into another. Therefore, regarding this study program, we can see that in 25 out of 41 modules, there has been adequate or partial integration of the European agenda priorities, while in 16 subjects there is no clear articulation of attention towards them.

The other undergraduate study program of this faculty, Design and Construction of Wood Products, has a total of 39 modules. The green agenda here has been adequately integrated into two modules, while in seven subjects this integration is partial. Digitalization has similarly been adequately integrated into two modules, while in five others it is partial. Research issues have been adequately integrated into two modules. Meanwhile, the Master's program in Architecture and Interior Design with Wood Products comprises 23 modules. The green agenda is only partially integrated into three of these modules, while digitalization is adequately included in four modules and partially in six others. Innovations are seen to be adequately integrated in only one module.

The Faculty of Tourism and Environment at UASF has only one study program at the Master's level titled 'Management and Innovation in Tourism'. This study program consists of 21 modules. In one of these subjects, we observe adequate integration of the green agenda, while there is partial integration in two other modules. Digitalization, on the other hand, has been adequately included in two modules, and partially in another two. Issues of innovation have been adequately included in one module.

The Bachelor's program in Graphic Design and Multimedia at the Faculty of Applied Arts also consists of 21 modules. It appears that the green agenda and issues of innovation have not found a place in any module of this study program. On the other hand, the issue of digitalization has been adequately integrated into five (5) modules, while it has been partially included in 14 others. There is one module where the issue of research has been adequately integrated, while in two others, there is partial integration.

Thus, issues related to digitalization or research has been adequately or partially integrated into all modules of this study program, whereas the green agenda and innovations have not received articulated attention in any of these instructional subjects.

Specifically, these four components of the European agenda have been adequately or partially integrated into 171 out of 269 modules across the 8 study programs of the five faculties at UASF, or approximately three-fifths of the total number of instructional subjects at this HEI.

These statistics reflect a developmental trend that is the result of a clear vision and articulated strategy for the university's development. As expressed by a representative of UASF, 'it is part of UASF's strategy to focus on aspects of sustainable economy, digitalization, and innovation (applied sciences)[5].' This commitment is evident from the structure of the study programs, specifically from the

[5]Prof. Dr. Bujar Pira, Vice-Rector, responses to the 'Questionnaire on the inclusion of elements of the green agenda, digitalization, research and innovation in study programs'.

planning of specific modules that fully or to a large extent address the four mentioned components of the European agenda.

4.2. Concluding remarks

Higher Education Institutions (HEIs) in the Western Balkans, including Kosovo, are facing great challenges and opportunities in the integration of priority topics of the European Union.

The results of the research show that, although there are early steps in the integration of topics such as Innovation and the Green Agenda in some study programs, in general these elements are not yet included in a sufficient and coordinated manner in all fields of study. The survey with participants from HEIs in Kosovo shows that there is a consensus on the need for improvements in curricular structures and for greater investments in the development of technological and academic capacities.

Based on the report's findings, recommendations to improve the situation include designing and updating curricula in line with the Green Agenda, Digitization and Innovation, including an interdisciplinary approach that integrates different fields of knowledge. Furthermore, investment in infrastructure and technology is necessary to facilitate the implementation of these topics in teaching and research.

Building sustainable partnerships with the private sector, non-governmental organizations and the research sector has also been identified as a need to ensure that HEI curricula are in line with the needs of the labor market and global developments.

These recommendations aim to help improve the quality of higher education in Kosovo and in the region, making it more suitable for the challenges and opportunities of a world transformed by technology and the needs of a sustainable environment.

ANNEX 1. UNIVERSITIES, PROGRAMS, AND NUMBER OF EVALUATED MODULES

University	Faculty	Number of evaluated programs	Number of evaluated modules	Level of studies	
				Bachelor	Master
University of Prishtina 'Hasan Prishtina'	Faculty of Economics	9	93	5	4
	Faculty of Education	15	71	3	12
	Faculty of Architecture	3	49	1	2
	Faculty of Philosophy	1	4	0	1
	Faculty of Law	7	33	1	6
	Faculty of Mathematics and Natural Sciences	11	156	6	5
	Faculty of Medicine	3	56	3	0
	Total	**49**	**462**	**19**	**30**
University 'Isa Boletini'	Faculty of Economics	2	75	2	0
	Faculty of Food Technology	2	113	3	0
	Faculty of Geosciences	3	130	3	0
	Faculty of Law	1	59	1	0
	Total	**8**	**377**	**9**	**0**
University 'Ukshin Hoti' Prizren	Faculty of Computer Science	2	64	2	0
	Faculty of Law	1	32	1	0
	Faculty of Life and Environmental Sciences	3	91	2	1
	Faculty of Economics	4	72	2	2
	Faculty of Education	2	78	2	0
	Total	**12**	**337**	**9**	**3**
University 'Haxhi Zeka'	Faculty of Business	6	136	3	3
	Faculty of Law	2	47	1	1
	Faculty of Tourism, Hospitality, and Environmental Management	2	67	2	0
	Faculty of Agribusiness	4	118	3	1
	Total	**14**	**368**	**9**	**5**
University of Applied Sciences Ferizaj	Faculty of Management	1	42	1	0
	Faculty of Engineering and Computer Science	2	83	1	0
	Faculty of Architecture, Design, and Wood Technology	3	103	2	1
	Faculty of Tourism and Environment	1	21	0	1
	Faculty of Applied Arts	1	21	1	0
	Total	**8**	**270**	**5**	**2**

Annex 2: Interviews with HEIs

- RIT Kosovo (A.U.K) - Lecturer
- University for Business and Technology - UBT
- AAB College - Vice Rector for External Cooperation
- University 'Kadri Zeka' - Vice Rector for Academic Development and Quality
- University 'Kadri Zeka' - Vice Rector for Budget, Finance, and Infrastructure
- University of Prishtina - Dean, Faculty of Civil Engineering
- University of Prishtina - Faculty of Philosophy
- University of Prishtina - Advisor to the Rector
- University of Prishtina - Faculty of Mechanical Engineering - Lecturer
- University of Prishtina - Faculty of Mathematics and Natural Sciences
- University of Prishtina - Faculty of Architecture
- University of Applied Sciences in Ferizaj - Rector
- University of Applied Sciences in Ferizaj - Vice Rector for International Relations and Quality Assurance

Annex 3. Questionnaire

Inclusion of elements related to the green agenda, digitalization, research and innovation in study programs

This study is conducted within the framework of the 'Policy Answers' project funded by the European Commission under the 'Horizon Europe' program. The aim of this study is to investigate the integration of elements related to the green agenda, digitalization, research and innovation in study programs, to assess how and to what extent the strategic objectives of the EU Agenda for the Western Balkans are reflected in the updates of study programs at Higher Education Institutions (HEIs) in Kosovo.

Please take the time to respond to the following questions and contribute to the quality of this study and recommendations regarding the advancement of study programs at HEIs.

University/College: Name and Surname: Position:

1. **Have you developed specific modules/courses that include elements of digitalization, the green agenda, research and innovation in your study programs?**

    a) Yes, we have already introduced new courses in our study programs.
    b) We have initiated discussions and are in the early stages of preparation.
    c) No, we have not started addressing this issue yet.

2. **'The Green Agenda' is included within the framework of the following courses/modules:**

    a) Circular economy is addressed within:
    b) Decarbonisation is addressed within:
    c) Environmental pollution is addressed within:
    d) Renewable energy is addressed within:
    e) Food security is addressed within:
    f) Biodiversity is addressed within:

3. **Digitalization is included into specific courses or within the following courses (list the courses):**

4. **Research and innovation is included in the following courses/modules:**

4.1. Is the subject 'Research Methods' included in your syllabus?

    a) Yes
    b) No

4.2. If yes, how many credits (ECTS) does this course have?

4.3. Practical work and skills development are carried out through:

a) Practical experience in research
b) Seminars/workshops

5. Innovation is included in the following courses/modules:

6. In your assessment, what are the barriers and challenges of including the elements of digitalization, research and innovation into study programs? Please elaborate on some of these barriers and challenges:

7. Any additional comments regarding the inclusion of elements from the green agenda, digitalization, research and innovation in study programs:

Thank you for your cooperation!

Riinvest Institute

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