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# **ACHIEVING SUSTAINABLE FINANCE - TRANSITION TOWARDS BETTER STUDY PROGRAMME OF THE ECONOMIC FACULTIES IN CROATIA**

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### ***Abstract***

*The study investigated the extent to which sustainable development and finance are embedded in teaching and research activities and examined the attitudes of finance teachers and the perceived institutional support for improving sustainability education in economics faculties and departments of universities in Croatia. The results of the survey were analyzed using descriptive statistics, categorical frequency analyses, Mann-Whitney test, t-test and correlations: Non-parametric Spearman correlation and parametric Pearson product moment correlation. The*



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*research findings confirm the importance of human capital - the role of teachers in implementing and enforcing the concept of sustainable finance/development. The effective implementation of the concept of sustainable finance in the teaching process is linked to an institutionally clear concept of sustainable development, scientific work and study abroad. The introduction of sustainable finance courses is more present at the graduate level than at the undergraduate level, where sustainable finance topics are gradually introduced into existing courses.*

**Keywords:** *sustainable finance, faculty of economics in Croatia, survey research*

## 1. INTRODUCTION

Sustainable finance has emerged as one of the most important pillars of the European Union's strategy in achieving climate neutrality and social inclusion. Sustainable finance serves as a tool to channel private investment towards the transition to a climate-neutral, resilient, and fairer economy and complements public funding (European Banking Authority, 2022). Sustainable finance is defined as the incorporation of environmental, social, and governance (ESG) criteria in financial investment decision-making in the financial industry, which translates to greater investment capital in sustainable economic activities (European Commission, 2021; Schoenmaker & Schramade, 2021). This paper conceptualizes sustainable finance as a wider term where the identification and assessment of sustainability criteria include ESG indicators; hence, the terms sustainable finance and ESG cannot be considered as being similar (Olgić Draženović, 2023). Green finance falls under the term sustainable finance since green finance specifically focuses on financial activities and financial instruments (such as green bonds and green loans), which provide financial support to environmentally sustainable activities. Otherwise, sustainable finance also views activities through the Integrated ES framework by incorporating the risk/return approach (for example, green bonds and green loans) (Billio, Murgia & Vismara, 2024).

In recent years, they have played a central role in aligning capital flows with the objectives of the European Green Deal and the Sustainable Development Goals (European Commission, 2021; OECD, 2020; European Banking Authority, 2022). This evolving framework sees the financial sector not only as a source of investment but also as a transformative actor in building a low-carbon, resilient, and inclusive economy (Schoenmaker & Schramade, 2021).

However, successful implementation of sustainable finance relies not only on regulatory mechanisms but also on the development of human capital with appropriate knowledge, skills, and values. Therefore, a green transition also requires adequate education, especially at the higher education level, to attract a skilled workforce capable of responding to the challenges of change. Universities, particularly economics faculties, are therefore the key institutions for embedding sustainability principles in formal education (McCowan, 2023; Council of the European Union, 2022). Recent research demonstrates that higher education

significantly enhances social awareness and readiness for sustainability, equipping individuals with the knowledge and skills needed to support sustainable investment and energy transition practices. In particular, financial education within higher education institutions plays a pivotal role in promoting responsible investment behaviours and accelerating the adoption of green finance mechanisms (Meng & Hao, 2024).

Despite the proliferation of EU-level regulatory frameworks and policy initiatives, the integration of sustainable finance principles into higher education curricula remains fragmented and inconsistent across member states (Ceulemans, Molderez & Van Liedekerke, 2015; Belinga & Morsing, 2020), with non-existing empirical research focusing on the Croatian context. Recent comparative studies highlight that while universities are increasingly expected to act as catalysts for the green transition, a persistent gap exists between policy aspirations and the actual integration of ESG and sustainable finance topics into economics and finance programmes (Lozano, Lukman, Lozano, Huisinigh & Lambrechts, 2013; Institut d'Estudis Financers, 2021). Furthermore, the literature emphasizes the importance of interdisciplinary approaches and institutional support in integrating sustainability into business education. Regional counterparts in other CEE countries also show the same gaps in curricula, which focus on the concept of "fragmented integration" as in the case of Croatia but in a way that varies in the level of institutionalization (Prazian & Prykhodko, 2023). In the case of Slovenia, education on sustainable finance is supported through ad-hoc AI technology and through cross-curricular approaches, which further advances 11 SGD (Ferk Savec & Jedrinović, 2025). In general, the context in the CEE emphasizes the absence of any empirical studies on the integration process of sustainable finance in the various university programmes (Gedvilaitė 2022), which concentrates more on the issue of youth financial literacy in general and the other integrations involving the SGD in which finance is not specifically earmarked. Although universities in the CEE are slowly integrating the SDGs (Szemler, 2024), the incorporation of sustainable finance curricula is still fragmented or non-existent in the universities, unlike AI-supported approaches in Slovenia. This regional gap in university studies highlights the novelty of the Croatian survey. This study contributes to the literature by presenting the first systematic, survey-based analysis of perceptions, teaching practices, and institutional support for sustainable finance among finance faculty in Croatia, thus filling a significant empirical gap in the regional and European context.

By examining both curricular content and institutional factors, the research offers nuanced insights into the drivers and barriers for integrating sustainable finance, which can inform targeted policy interventions and curriculum development at the faculty and national levels. Moreover, the findings have broader implications for other EU member states with similar educational and institutional structures, offering a transferable methodological framework for assessing the state of sustainable finance education elsewhere.

In response to this challenge, the primary goal of this study is to assess the level of integration of sustainable finance in the curricula of economics faculties/departments of universities in Croatia. The study aims to identify the

extent to which sustainable development and finance are embedded in teaching and research activities and to investigate the attitudes of academic staff and perceived institutional support for improving sustainability education. Specifically, the following research questions will be addressed:

1. To what extent is the concept of sustainable development implemented in the Croatian economy?
2. How is sustainable development presented in the study programmes and activities of economics faculties?
3. How far has the integration of sustainable finance into undergraduate and postgraduate programmes progressed?
4. How active is the academic staff in research and teaching on sustainable finance and sustainable development?
5. What importance is attached to sustainable finance for understanding the general sustainability goals?

To investigate these questions, a semi-structured interview was first conducted with the vice-deans of the faculties of economics and of the departments of economics in the Republic of Croatia.<sup>1</sup> Based on the responses and an insight into the curricula, we have created questionnaire. Questions were pilot-tested by finance teachers not included in survey creation. Purposive sampling was used and the survey was conducted in the first half of 2024 among a sample of all seventy teachers of finance courses in the above-mentioned faculties or departments. Fifty teachers responded to the survey. The results were analysed using descriptive statistics, categorical frequency analysis, and correlations (non-parametric Spearman correlation and parametric Pearson product-moment correlation).

Whereas the state of the integration of sustainability topics has been found to be piecemeal in previous studies, this research fills the gap in providing the first systematic evidence at the faculty level in Croatia, specifically in the area of sustainable finance. The paper advances the knowledge on the drivers and barriers underpinning the education in sustainable finance in the CEE region by linking curricular representation, academic engagement, learning outcomes and perceived institutional support. The contribution of this study is twofold. First, it provides empirical evidence on the status and perception of sustainable finance education in Croatia, an under-researched national context within the EU. Second, it identifies specific institutional and curricular gaps.

The rest of the paper is organised as follows: Section 2 reviews the relevant literature and legal framework for sustainable finance and education. Section 3 outlines the methodology and research design. Section 4 presents the empirical results of the survey. Section 5 discusses the results in the context of

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<sup>1</sup> Faculties of Economics of the Universities of Osijek, Pula, Rijeka, Split and Zagreb; The Faculty of Tourism and Hospitality Management of the University of Rijeka; Departments of Economics of the Universities of Dubrovnik and Zadar.

existing research and policy initiatives. Section 6 concludes with recommendations for curriculum development and suggestions for further research.

## 2. LITERATURE REVIEW

Sustainable finance is a key component of the shift to a climate-neutral and socially equitable economy (European Commission, 2021; OECD, 2020). According to Schoenmaker and Schramade (2021), sustainable finance is a paradigm shift in the financial sector that replaces the shareholder value maximisation model with a multi-stakeholder approach (stakeholder value) that guarantees social responsibility and long-term resilience. The financial industry must play a transformative role in this regard, which calls for significant adjustments to the way aspiring professionals are trained.

Using the EU taxonomy, the Sustainable Finance Disclosure Regulation (SFDR), and other guidelines, the ESG approach seeks to encourage investments that support social justice, environmental protection, and long-term resilience. These legislative solutions provide a regulatory basis for redirecting capital towards sustainable activities (European Banking Authority, 2022). In this regard, the regulatory environment for sustainable finance has been further broadened and improved by recent events at the EU level. The European Commission released non-binding recommendations on June 13, 2023, to help financial and non-financial firms use EU sustainable finance instruments voluntarily to assist in their transition. As long as they have believable and quantifiable transition plans, these tools are designed for businesses at an earlier stage of sustainability integration as well as those with strong ESG performance. A greater variety of actors, including SMEs, can engage in the green transition in a flexible and proportionate manner thanks to this inclusive approach (European Commission, 2023). The Commission has also added new activities to the EU Taxonomy and suggested new guidelines for ESG rating agencies. In order to boost investor confidence and the integrity of sustainable financial products, these actions seek to increase market transparency and lower the risk of greenwashing. The EU Taxonomy is the foundation of the sustainable finance architecture and supports businesses and investors in identifying the economic activities that have the greatest impact on environmental goals. Previous studies on ESG issues have found evidence of the growing significance of sustainability-related disclosure and risk management in terms of investors' expectations in the market as well as financial institution positioning. Nevertheless, Tuškan Sjauš, Zlovolić, and Krišto (2024) note that significant problems are still present in its practical application, especially in relation to the social dimension and its measurability. This highlights the need to strengthen analytical and conceptual competencies in sustainable finance. For this reason, there is a significant emphasis on enhancing ESG skills in the finance sector and the higher education system (Olgić Draženović, 2023).

Research on higher education suggests that study programmes often change more slowly than the economy does. This can leave a gap between what

students learn at university and the skills employers now expect in the labour market (Štimac and Bilandžić Tanasić, 2023). In its Roadmap for Sustainable Finance (2022), the European Banking Authority (EBA) has stressed that the financial risk landscape will change as a result of ESG risk failures. Since these risks have turned into financial ones, coordinated regulatory and supervisory action is needed. Increased transparency, ESG stress testing, incorporating ESG risks into supervision, and conformity to transition planning procedures are among the EBA's top priorities. The development of human capital is still vital, even though regulatory mechanisms are changing. Sustainable finance cannot thrive without highly qualified experts who can evaluate ESG risks, design green investments, and assist businesses in their transformation (European Commission, 2019; McCowan, 2023). This is highlighted in the European Green Deal and its follow-up policy communications.

In February 2025, the European Commission presented the Omnibus Package, which proposed targeted amendments to the existing framework for sustainable finance. These included the refinement of disclosure requirements under the Sustainable Finance Disclosure Regulation (SFDR), simplifications for financial market participants, and measures to improve the usability of the EU Taxonomy. While some of these changes reflect concerns about administrative burdens and implementation challenges, the Commission emphasised that the strategic objectives of sustainable finance remain unchanged. On the contrary, the package reaffirms that sustainable finance is more necessary than ever to mobilise the investment needed for the green and digital transitions and to safeguard financial stability against escalating climate and ESG risks (European Commission, 2025).

These advancements demonstrate that sustainable finance is still regarded as a key facilitator of Europe's sustainability and climate goals, even in the face of continuous modifications. Financial education is essential for encouraging sustainable investment practices and assisting the efficient operation of financial markets, especially considering the intricacy of sustainable finance and its regulatory environment. According to Singer-Brodowski (2023), enhancing financial literacy in sustainable finance should be understood as part of transformative learning, as it fosters critical awareness, empowers individuals, and supports informed investment choices that advance the green transition.

In this regard, one of the most important tools for accomplishing the Sustainable Development Goals is education. Universities and educational institutions are crucial change agents, according to the EU, especially when it comes to carrying out the objectives of the European Green Deal. The European Council recommended the implementation of systematic support for learning about the green transition at all educational levels in 2022 after observing that youth believe the current formal education system is inadequate for understanding climate change (European Education Area, 2022). Because of their extensive societal reach and influence on a variety of stakeholders, universities are the most significant long-term hubs for increasing awareness and taking action on climate change (McCowan, 2023).

Analyses conducted at the global and European levels confirm that the implementation of sustainable finance in higher education programmes is not yet systematic. Ceulemans et al. (2015) and Lozano et al. (2013) point to a discrepancy between the declared support for sustainability and the actual integration into the teaching process. Research by Institut d'Estudis Financers (2021) confirms a similar finding that the integration of ESG content mostly depends on the initiative of individuals and lacks strategic support from institutions.

Leogrande and Costantiello (2023) point out that investment in education has a positive impact on the overall economic willingness to accept the ESG model, while Alexander, Cazzaniga, Fabrizio, Jaumotte, Li, Mondragon, Priano and Tavares (2024) show that a higher proportion of STEM-educated workers and gender equality correlate positively with more effective climate policy implementation. The authors identify "green jobs" as a growing labour segment with particularly pronounced gender inequalities (women make up only a third of the workforce) that requires targeted education and market interventions. Similarly, Prazian and Prykhodko (2023) emphasise that higher education institutions play a central role in building a resilient society. In line with this, a comprehensive systematic literature review by Lal, Nagariya and Dawar (2024), covering the period from 1990 to 2023, highlights the importance of preparing students to address sustainable development challenges by promoting early integration of sustainability education and the adoption of holistic, interdisciplinary curricula. These educational strategies are recognised as key enablers for strengthening societal resilience and advancing the long-term development of sustainable finance. ESG competences should be implemented at all levels of higher education, including lifelong learning strategies to ensure adaptation to an increasingly "green" labour market. Rimanoczy (2020) introduces the concept of sustainability mindset and emphasises the importance of creating a value framework in students that goes beyond technical knowledge and promotes social responsibility and sustainable thinking. Da Silva Neiva, de Amorim, Deggau, de Lima, do Livramento Gonçalves, Ceci, Birch and de Andrade Guerra (2021) emphasized that higher education institutions engage with local communities to address pressing issues, thereby translating academic knowledge into practical solutions that benefit society. Empirical studies confirm that education and acquired competencies have a measurable effect on economic behaviour and outcomes, further justifying analysis of the content and structure of study programmes as a relevant research area (Morić Milovanović, 2023).

In a digital context, Burnaev, Mironov, Shpilman, Mironenko, and Katalevsky (2023) emphasise the potential of artificial intelligence to address ESG challenges, particularly in risk analysis and strategic reporting. However, they also warn of new challenges such as increased energy consumption and ethical dilemmas. The need for regulatory adaptation is also highlighted by the AI Act, the implementation of which is an important test of the balance between innovation and responsible management (Meyers, 2024).

In conclusion, the literature confirms that the integration of sustainable finance into the education system requires systematic reforms: the development of

new courses and curricula, faculty training, strategic institutional support, and networking with the regulatory and financial sectors. This would make it possible to train staff capable of responding to the challenges of the green and inclusive transition.

### 3. DATA AND METHODOLOGY

Based on a semi-structured interview with vice deans for teaching and insights into the curricula of economics faculties and/or economics departments in the Republic of Croatia, a questionnaire was prepared and sent by e-mail using Google Forms to members of finance departments (at faculties) and finance teachers at economics departments. Of the 70 finance teachers at faculties and departments in the Republic of Croatia, 50 of them (71.41%) responded to the survey and completed the questionnaire.<sup>2</sup>

The results were analysed using descriptive statistics and categorical frequency analyses. Responses were compared by demographic characteristics: gender and age (younger and older than 40) using Mann-Whitney test and t-test for independent samples. In addition, the correlation analysis and the non-parametric Spearman correlation, as well as the Pearson product-moment correlation, were applied.

The demographic details of the study participants are presented in Table 1. The bulk of the population belonged to the 40–49 age group, and 54.0% of the sample consisted of females and 46.0% of males. Most participants (38%) were associate professors.

Table 1 Demographic profiles of respondents

Category	Criteria	Frequency	Percentage
Gender	Male	23	46
	Female	27	54
	Total	50	100
Age	Less than 30	2	4
	Between 30 and 39	17	34
	Between 40 and 49	19	38
	Between 50 and 59	9	18
	More than 60	3	6
	Total	50	100
Academic title	Postdoctoral fellows	1	2
	Assistants and senior assistants	11	22
	Assistant professors	3	6
	Associate professors	19	38
	Full professors	9	18
	Full professors with permanent titles	7	14
	Total	50	100

Source: authors

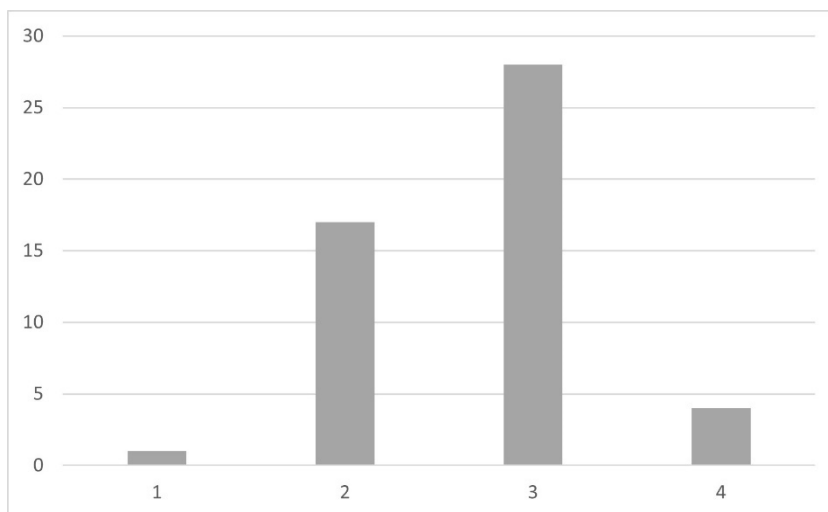
<sup>2</sup> The data that support the findings of this study are available on request from the corresponding author.

## 4. RESULTS

### 4.1. Implementation of the concept of sustainable development in the Croatian economy

The concept of sustainable development, according to the Brundtland Report (1987) is "development that meets the needs of present generations without compromising the ability of future generations to meet their own needs". Most of the respondents (28 or 56.0%) evaluated the implementation of the concept of sustainable development in Croatian economy at medium level, with grade 3 (Figure 1). Interestingly, none of the respondents evaluated this implementation with highest grade (5).

Figure 1 The degree of implementation of the concept of sustainable development in the context of the Croatian economy (Q1) (1-lowest level and 5-highest level of implementation)

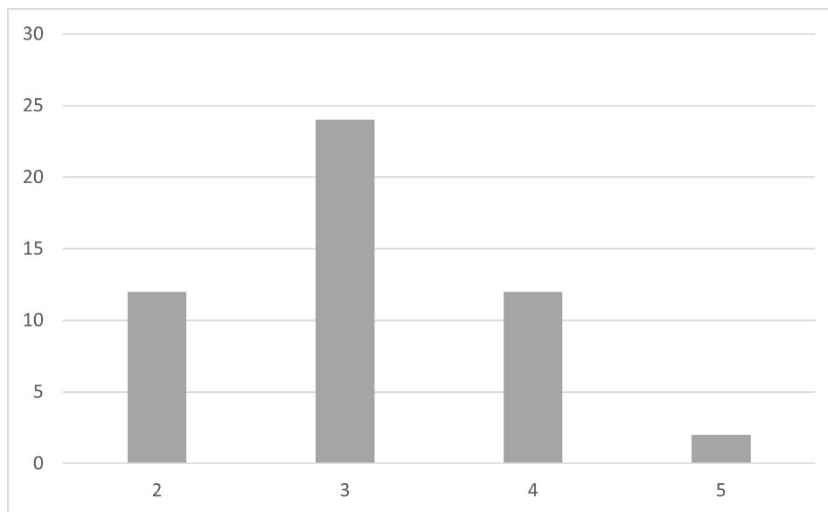


Source: authors

### 4.2. Representation of the concept of sustainable development within the study programmes

In the context of improving the level of implementation of sustainable development, students need to be familiarised with the topic during the educational process, especially at university level. That's why the question regarding the representation of the concept of sustainable development within the study programmes is very important. According to the data obtained, most survey participants rated the representation of the concept of sustainable development within the study programmes within their faculty/department with 3. The data are shown in Figure 2.

Figure 2 Representation of the concept of sustainable development within the study programmes within your faculty/department (Q2) (1-lowest level and 5-highest level of implementation)



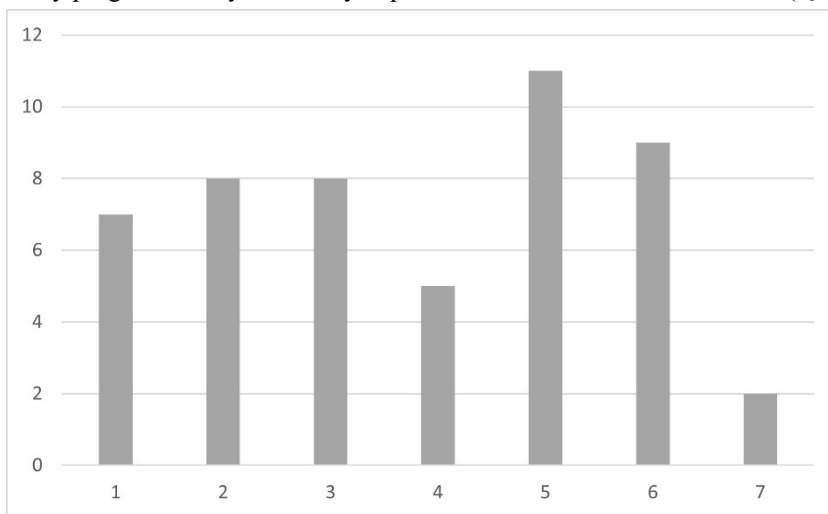
Source: authors

The question of “How is the concept of sustainable development represented within your faculty/department?” is asked in order to access the more detailed information about representation of the concept of sustainable development within the study programmes at the faculty/department. Respondents were offered 7 options for implementing the concept of sustainable development at faculties/departments (courses, study programmes, cross-curricular within existing finance/economics courses, professional projects, scientific projects, promotional activities, scientific articles).

From all respondents, 30 or 60.0% answered that there is a special course for sustainable development, but on the other hand, just 13 or 26.0% answered that there is a study programme specialized in sustainable development. Furthermore, 32 or 64.0% answered that sustainable development is represented cross-curricular in different courses, as integration within core finance/economics curricula rather than general electives. Interestingly, 31 or 62.0% of the respondents participated in the professional projects that are in the field of sustainable development, and 30 or 60.0% participated in scientific projects in the field of sustainable development. Furthermore, only 18 or 36.9% of the respondents answered that the university/faculty is involved in support measures for sustainable development. Finally, the vast majority (36 or 72%) of respondents have already participated in writing articles in the field of sustainable development. These findings are consistent with earlier studies, which highlight the lack of systematic integration of sustainable development in higher education curricula across Europe (Ceulemans et al., 2015; Lozano et al., 2013). For each respondent, the total number

of the aforementioned seven activities regarding the concept of sustainable development is summed, and the result is shown in Figure 3.

Figure 3 How is the concept of sustainable development represented within the study programme at your faculty/department? Total number of activities (Q3)



Source: authors

The moderate implementation level suggests an awareness of the concept, but also reveals barriers to deeper integration, particularly in the Croatian academic context. The descriptive statistics for the total number of activities related to sustainable development (Q3) presented in Figure 3 can be found in Table 2. Of the 7 activities offered, respondents have an average of 3.8 activities.

Table 2 Descriptive Statistics on the total number of activities of the representation concept of sustainable development in study programmes

Measure	Value
Valid	50
Mean	3.80
Std. Error of Mean	0.260
Median	4.00
Lower quartile	2.00
Upper quartile	5.00
Mode	5
Std. Deviation	1.841
Skewness	-0.082
Kurtosis	-1.262
Range	6
Minimum	1
Maximum	7

Source: Authors

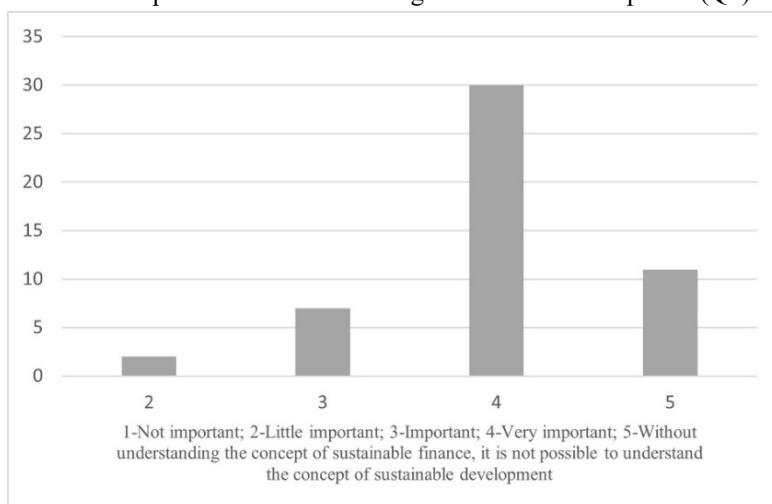
To get a better understanding of the practical and theoretical aspects of sustainable development, two more questions were asked. Namely, the first question was “How many articles in the field of sustainable development have you published in the last five years?”, and the second was “How many projects dealing with the concept of sustainable development have you participated in the last five years?”. The results show that 23 or 46.0% of respondents did not publish any article on sustainable development and the majority (27 or 54.0%) of respondents did not participate in any project regarding sustainable development.

Although most respondents indicated publication on sustainable development, the lower rate of project engagement reflects Belinga and Morsing (2020) who emphasized the fragmentation between academic discourse and applied institutional strategies. This gap highlights the need for institutional support and funding mechanisms for sustainability related projects.

### 4.3. The importance of the concept of sustainable finance for understanding sustainable development

In order to find out more about the influence of sustainable finance on sustainable development, the question was asked to what extent the concept of sustainable finance is important for understanding sustainable development. In Figure 4 the results are shown. As expected, none of the respondents answered that there is no importance of understanding sustainable finance for understanding the concept of sustainable development. Respondents predominantly (41 or 82%) emphasise that the concept of sustainable finance is as very important or essential for understanding sustainable development.

Figure 4 What is your opinion to what extend is the concept of sustainable finance important for understanding sustainable development (Q4)

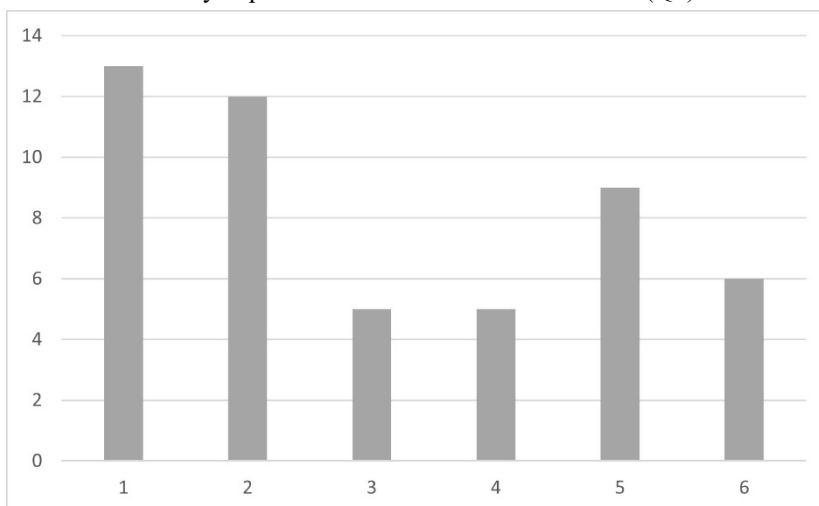


Source: authors

In order to find out how the concept of sustainable finance is implemented at the university/faculty, the question of how the concept of sustainable finance is represented at your faculty/department was also analysed. Again, respondents were offered seven options: Courses, study programmes, cross-curricular within existing courses, professional projects, scientific projects, promotional activities, scientific articles. Of all respondents, 24 or 48.0% answered that there is a specific course on sustainable finance, but only 3 or 6.0% answered that there is a study programme specialised in sustainable finance. In addition, 35 or 70.0% responded that the topic of sustainable finance is represented in the various study programmes across disciplines. Total of 23 (46.0%) of respondents have participated in professional projects in the field of sustainable finance, and 20 or 40.0% have participated in academic projects in the field of sustainable finance. Overall, 26 or 52.0% have participated in a professional or scientific project regarding sustainable finance. Moreover, only 14 or 28.0% of respondents answered that the University/Faculty is involved in promotional activities that encourage sustainable finance. Finally, the vast majority (34 or 68.0%) of respondents have already participated in writing articles in the field of sustainable finance.

Compared to the same question regarding sustainable development, the result suggests a lower level of implementation of sustainable finance at the University/Faculty of the respondents, even though the target group was the teaching and research staff at the department/field of finance. In contrast to the responses relating to sustainable development activities, none of the respondents marked all the options offered opportunities related to sustainable finance. The number of participants in activities regarding sustainable finance was summed, and the distribution of the total number of activities is shown in Figure 5.

Figure 5 How is the concept of sustainable finance represented within your faculty/department? Total number of activities (Q5)



Source: authors

Of the seven activities offered in connection with sustainable finance, the respondents indicated an average of 3.06 activities. The descriptive statistics for the total number of activities in the area of sustainable development (Q5) from Figure 5 can be found in Table 3.

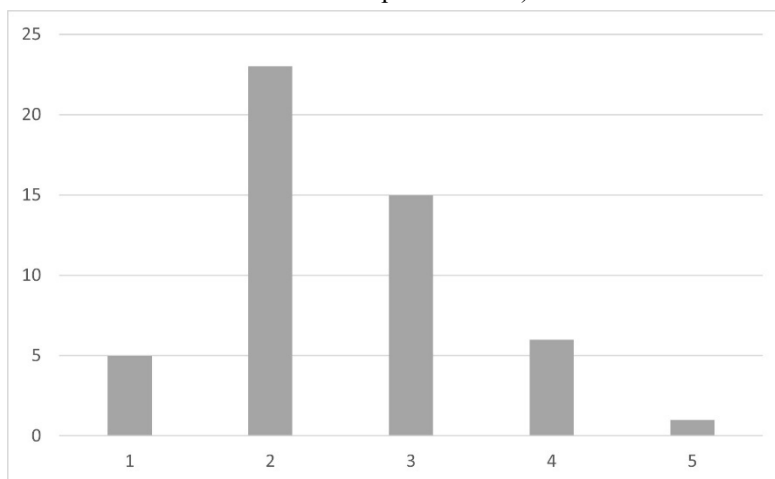
Table 3 Descriptive Statistics on the total number of activities of the representation concept of sustainable finance at the University/Faculty

Measure	Value
Valid	50
Mean	3.06
Std. Error of Mean	0.255
Median	2.50
Lower quartile	1.00
Upper quartile	5.00
Mode	1
Std. Deviation	1.800
Skewness	0.344
Kurtosis	-1.373
Range	5
Minimum	1
Maximum	6

Source: authors

The next question was to evaluate the representation of the concept of sustainable finance in the study programmes at the faculty/department. The results are shown in Figure 6.

Figure 6 Representation of the concept of sustainable finance within the study programmes within your faculty/department (Q6) (1-lowest level and 5-highest level of implementation)



Source: authors

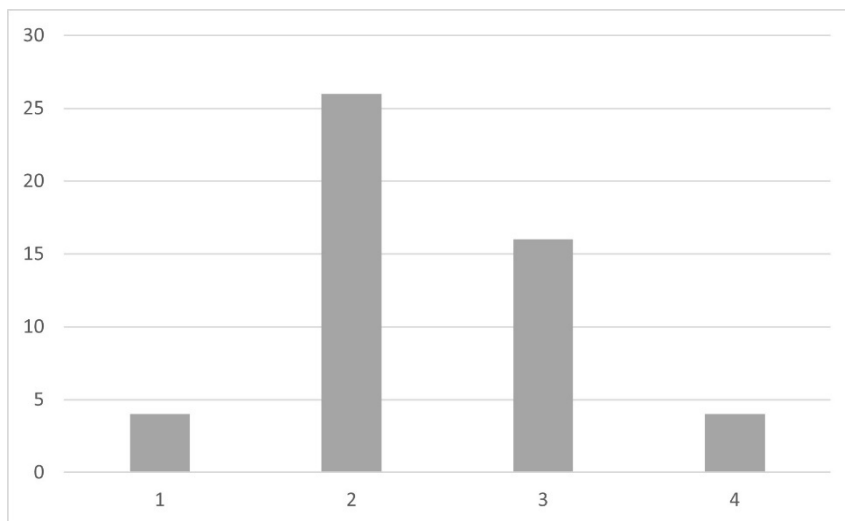
This research aimed to gain deeper insights into sustainable finance at universities and faculties of economics in Croatia, focusing on its implementation within study programmes. The majority of respondents indicated that sustainable finance is not adequately represented in study programmes (Figure 6). Additionally, a separate assessment was made of the representation of sustainable finance in undergraduate and graduate study programmes.

Regarding undergraduate studies, some of the respondents (14 or 28.0%) answered that there is a special course for sustainable finance, while only 3 respondents or 6.0% answered that there is a study programme specialized in sustainable finance. Moreover, 36 or 72.0% note that sustainable finance is addressed in a cross-curricular manner, suggesting that sustainable finance topics are often dispersed across various courses rather than being systematically embedded. Only 8 or 16.0% of the respondents answered that sustainable finance is not represented in the study programmes at the faculty/department.

This finding is consistent with the literature, which emphasizes the need for more comprehensive integration of sustainable finance into higher education curricula and the importance of preparing students for the demanding job market and new professions (Lozano et al., 2013; UNEP FI, 2021). Lack of specialized programmes may limit the ability of future economists to respond to the green transition and ESG standards, as highlighted by the European Commission (2021).

From the data shown in Figure 7, we can see that the respondents perceive that sustainable finance is not represented enough at this level. Moreover, none of the respondents rated the representation of sustainable finance with the highest score (5) so this points to the lack of presence of sustainable finance at the undergraduate level. This means we there is a need a strategic approach to curriculum development, introducing new courses and programmes and enhancing interdisciplinary cooperation.

Figure 7 Rate the representation of the concept of sustainable finance in study programmes at the undergraduate studies level (Q7) (1-lowest level and 5-highest level)

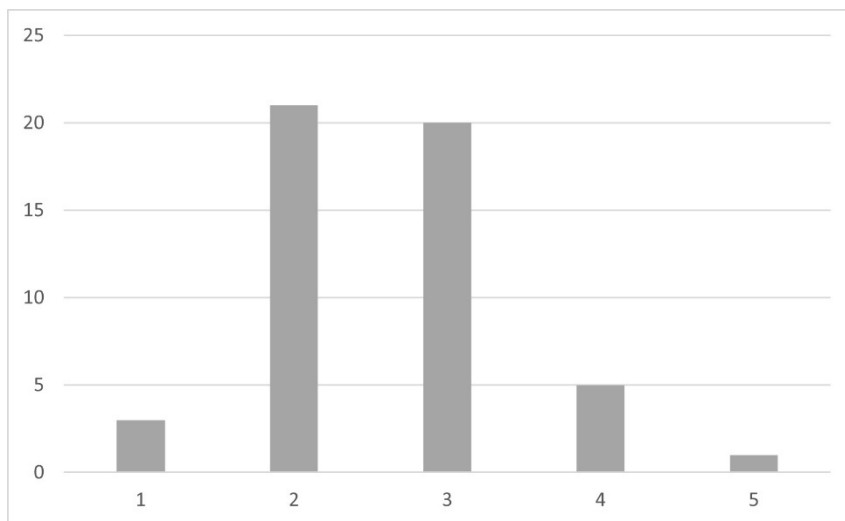


Source: authors

In terms of undergraduate study programmes, the majority of respondents (30 or 60%) stated that the concept of sustainable finance is not represented at all or it is very poorly represented. The way in which sustainable finance is presented in the undergraduate study was additionally analysed through several questions. There were 14 answers (28.0%) that point out that there is a specific course in sustainable finance, while only 3 respondents (6.0%) stated that there is a specific study programme in this area. The majority or 72.0% (36 respondents) answered that sustainable finance is represented in various study programmes across different disciplines, indicating an integrated and non-specialised approach. In addition, 8 respondents (16.0%) stated that the topic of sustainable finance is not represented at the undergraduate level.

Figure 8 shows the results from the respondents regarding the representation of the concept of sustainable finance in study programmes at the graduate studies level.

Figure 8 Rate the representation of the concept of sustainable finance in study programmes on the graduate studies level (Q8) (1-lowest level and 5-highest level)



Source: authors

On graduate level, 82% rated representation as low/moderate, primarily through cross-curricular approaches (66%) and dedicated courses (52%).

These findings highlight that, although the presence of sustainable finance is somewhat more pronounced at the graduate level compared to undergraduate studies, its integration remains largely fragmented and insufficiently specialized. The low integration of sustainable finance at the undergraduate and graduate levels, despite positive attitudes among respondents, is in line with conclusions from Meng and Hao (2024), who stress the importance of structured, cross-curricular ESG content supported by clear institutional guidelines.

#### 4.4. Evaluating the need for a special course dedicated to sustainable finance and a possible name for the course

The survey results for the question “Do you think it is necessary to introduce a specific course on sustainable finance within the study programmes?” indicate that most respondents (28 or 56.0%) believe it is necessary. There were 11 respondents (22.0%) stated that such a course already exists, while a further 11 (22.0%) do not see the need for its introduction. If we merge the respondents who think it is necessary and those who already have such a course, we can conclude that respondents mostly have positive attitude as a good foundation for further

curriculum development and potential expansion of specializations in sustainable finance.

This is in line with the growing emphasis in literature on the role of formal education in supporting the green transition (Weiss et al., 2021; Singer-Brodowski, 2023; Meng & Hao, 2024). A dedicated course is needed to bridge the gap in curriculum structure and to respond to the demands of both students and the labour market for sustainability-related competencies. As Ceulemans et al. (2015) and McCowan (2023) highlight, institutionalisation of sustainability in education is most effective when it goes beyond elective content and is embedded as a formal, core component of study programmes.

Regarding the possible names for this special course, a large share of respondents (58.0%) provided suggestions. All proposed names are presented below, without repeating them:

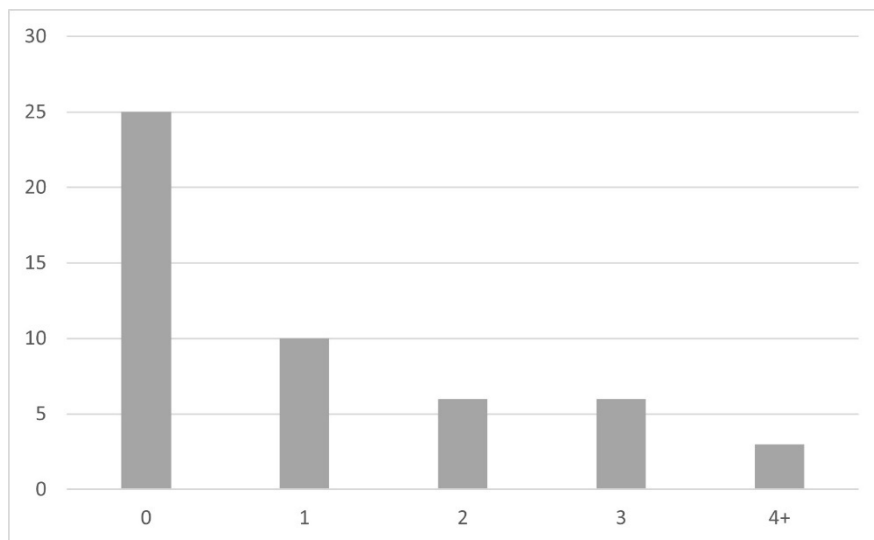
- Central banks and green transition
- ESG concept of doing business
- ESG investment
- Financing the environmental protection
- Green financing
- Finance and sustainable development
- Multidisciplinary sustainable finance
- Socially responsible finance
- Sustainable and responsible financial investments
- Sustainable growth and finance
- Sustainable finance
- Sustainable financing
- Sustainable finance and ESG criteria
- Sustainable finance or personal finance
- Sustainable ways of financing

The name Sustainable Finance was suggested by a total of 12 respondents, while the other names were suggested only once. Proposed course titles show both the diversity of sustainability concepts in finance and the focus on integrating environmental, social and governance dimensions into financial education. Such a course would lead to greater standardization, relevance and effectiveness of higher education in this area.

#### **4.5. Published articles in the field of sustainable finance in the last 5 years**

We also examined the number the articles in the field of sustainable finance in the last 5 years that the respondents have published, presented in Figure 9.

Figure 9 Number of articles in the field of sustainable finance in the last 5 years (Q9)



Source: authors

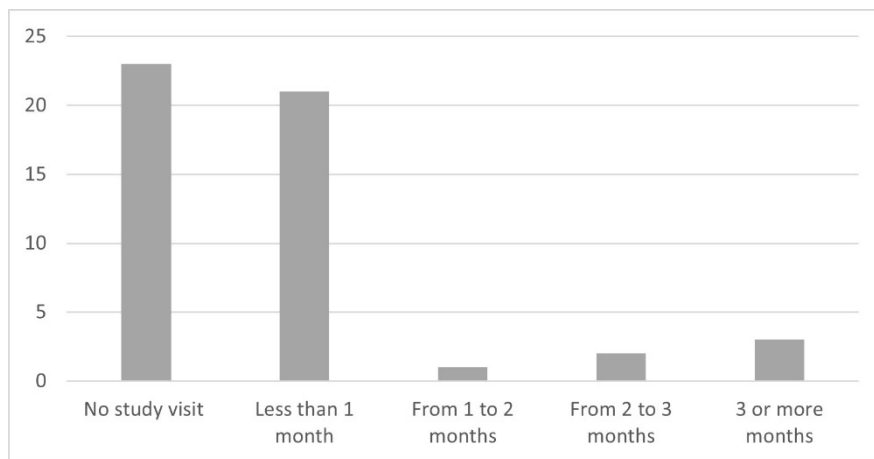
Figure 9 shows that half of the respondents have not published articles on sustainable finance in the last five years, which is fewer than those who have not published on sustainable development. The results are somewhat expected, as the field of sustainable finance has recently gained a lot of importance. For example, the first green bonds, which marked the beginning of the development of a sustainable finance market, were issued by the European Investment Bank in 2007.

#### 4.6. Study visits outside Croatia in the last 5 years

We assumed that the study visits (teaching staff mobility) contribute to a deeper understanding of global trends in the field of finance, particularly sustainable finance. That is why we evaluated the question of study visit duration that the respondents have had in the last 5 years. The results are shown in Figure 10.

Results indicate that most of the survey participants (23 or 46%) did not participate in a study visit abroad, while 21 participants (42%) completed a study visit that was less than one month long. The participants with a longer period of study visit are less represented.

Figure 10 Study visits outside of Croatia in the last 5 years (Q10)



Source: authors

This suggests that there is a need for increasing teaching mobility of staff in finance departments at Croatian economic faculties because greater international exposure can lead to knowledge and experience exchange and facilitate their transfer into innovative teaching practices and curriculum development in sustainable finance. Limited mobility among faculty members, in turn, may further limit exposure to best practices in sustainability education. As McCowan (2023) points out, academic mobility plays a crucial role in transferring knowledge, fostering innovation, and strengthening transnational collaboration on sustainability topics. Strategic investments in faculty exchange programmes can bridge this gap.

#### 4.7. Learning outcomes and sustainable finance

We continue our research with the question, “Do the learning outcomes of your courses include topics from sustainable finance? (at least one course)”. Most survey participants respondents (31 or 62.0%) answered negatively. On the other hand, for the question “How much would clear, and measurable learning outcomes help for greater representation of sustainable finance in study programmes at your faculty/department?” the majority of respondents (26 or 52.0%) opposite from the previous question, believed that clear learning outcomes would contribute significantly or very significantly to greater inclusion of sustainable finance in their programmes.

To summarise, although the majority of respondents believe that clear and measurable learning outcomes would help to raise the topic of sustainable finance in study programmes, the majority have not included these learning outcomes in their courses. Currently, the concept of sustainable finance is less prominent in all

finance courses and is at least mentioned in classes in the context of specific practical examples, while the stated learning outcomes are largely generic.

#### 4.8. Comparison by demographic characteristics

Responses of female and male respondents were compared using Mann-Whitney test for ordinal variables and t-test for independent samples for numerical variables. There was not significant difference among genders for any variable at the significance level  $\alpha = 0.10$ .

The same analysis was performed for comparison of respondents younger than 40, and those aged 40 and older. Younger respondents rate representation of the concept of sustainable development within the study programmes (Q2) higher (Mdn = 3, rank = 29.61) than older (Mdn = 3, rank = 22.98) respondents,  $z = -1.68$ ,  $p = .093$ . Older respondents have published significantly more articles about sustainable finance (Q9) (Mdn = 1, rank = 28.50) than younger (Mdn = 0, rank = 20.61) respondents,  $z = -2.00$ ,  $p = .045$ . There was not significant difference for other variables at the significance level  $\alpha = 0.10$ .

#### 4.9. Analysing the correlation of the answers

The responses listed in the tables were correlated with each other, although it should be noted that this does not represent a cause-and-effect relationship. The purpose of this analysis is to compare the direction and intensity of movement between the responses. For this purpose, Spearman's non-parametric correlation and Pearson's parametric correlation were used, depending on the type of variables. The Pearson correlation was used when both variables were numeric (Q3 and Q5), while the Spearman correlation was used when both variables were ordinal (all variables except Q3 and Q5) or when one variable was ordinal and the other numeric (Table 4).

Table 4 Correlation Matrix of Study Variables (Spearman's  $r_s$  and Pearson's  $r$ )

Variables	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Q1	-								
Q2	.49***	-							
Q3	.24*	.61***	-						
Q4	-.17	.03	.26*	-					
Q5	-.06	.32**	$r = .70$ ***	.38***	-				
Q6	.14	.46***	.42***	.32**	.45***	-			
Q7	.17	.41***	.30**	.20	.24*	.57***	-		
Q8	.14	.52***	.42***	.25*	.42***	.64***	.73***	-	
Q9	-.16	.07	.33**	.35**	.40***	.18	.08	.12	-
Q10	-.28**	-.09	-.07	.22	.07	-.08	-.08	-.03	.10

Notes: 1) All values are Spearman's rank-order correlation coefficients ( $r_s$ ) except for the correlation between Q3 and Q5, which is Pearson's product-moment correlation ( $r$ ). 2) \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .10$

Source: authors

The correlation matrix shows that all significant coefficients are positive, except the relationship between the study visit (Q10) and the assessment of the implementation of sustainable development in the Croatian economy (Q1) ( $r_s = -.28$ ,  $p = .05$ ), which was to be expected. International experience provides information about a higher level of implementation.

Among many correlations presented in the matrix, we focus on the correlations of the representation of sustainable finance in teaching (in study programmes (Q6), undergraduate studies (Q7), and graduate studies (Q8)), in line with the topic of our study. The highest correlation coefficient ( $r_s = .73$ ,  $p < .001$ ) exists between the presentation of sustainable finance in undergraduate programmes (Q7) and graduate programmes (Q8). The perception of the importance of sustainable finance manifests itself in the implementation at all levels of the study programme, which is also reflected in the high correlation coefficient between the presentation of sustainable finance in the study programme (Q6) and graduate studies (Q8) ( $r_s = .64$ ,  $p < .001$ ) and in undergraduate studies (Q7) ( $r_s = .57$ ,  $p < .001$ ).

The view on the importance of sustainable finance for the understanding of sustainable development (Q4) is in part significantly correlated with the presentation of sustainable finance in teaching. There is a significant correlation with sustainable finance in study programmes (Q6) ( $r_s = .32$ ,  $p = .03$ ) and with sustainable finance in graduate programmes (Q8) ( $r_s = .25$ ,  $p = .08$ ), but no significant correlation with undergraduate programmes (Q7), indicating a novelty in the context of higher levels of study.

The presentation of sustainable finances in teaching is also associated with the presentation of sustainable development at the faculties (Q2) (association with study programmes (Q6):  $r_s = .46$ ,  $p < .001$ ; with undergraduate studies (Q7):  $r_s = .41$ ,  $p = .003$ ; with graduate studies (Q8):  $r_s = 0.52$ ,  $p < .001$ ). The relationship between sustainable finance in teaching and the number of total activities in the area of sustainable development (Q3) is also present ( $r_s = 0.42$ ,  $p = .002$ , association with study programmes (Q6);  $r_s = 0.30$ ,  $p = .04$ , undergraduate studies (Q7);  $r_s = .42$ ,  $p = .002$ , graduate studies (Q8)). As some elements of the representation of sustainable finance in teaching are included in the number of sustainable finance activities (Q5), we do not consider the coefficient between these variables.

A high coefficient ( $r = .70$ ,  $p < .001$ ) is found between the number of sustainable development activities (Q3) and sustainable finance activities (Q5). This is to be expected as sustainable finance is a key component of sustainable development because it ensures the alignment of financial flows with environmental and social priorities (European Commission, 2021; OECD, 2020).

Although the respondents agree that the topic of sustainable finance is very important or essential to the understanding of the subject sustainable development, it is clear that the institutional environment is not conducive to systematic integration, especially at undergraduate level. This is because the respondents agree that there is a lack of formal and strategic support for the topic.

In other words, most initiatives rely on individual efforts. Introducing a specialised course in sustainable finance involves additional workload for lecturers but lacks visible benefits related to career advancement or accreditation requirements, which may reduce departments' motivation to redesign the curriculum at both undergraduate and postgraduate levels.

## 5. CONCLUSION

The primary objective of this research was to assess the level of integration of sustainable finance into the curricula of economics faculties/departments of universities in Croatia. The research idea is based on theoretical findings and previous research that the successful implementation of sustainable finance depends not only on regulatory mechanisms, but also on the development of human capital with appropriate knowledge, skills and values. Economics faculties are therefore the key institutions for embedding sustainability principles in formal education and for promoting sustainable finance mechanisms and investment behaviour. Due to the constant discrepancy between policy aspirations and the integration of sustainable finance principles into finance programmes, the study provides a survey-based analysis of the perception, teaching and support of sustainable finance among finance teachers at faculties and departments of economics in Croatia, thus filling a significant empirical gap in the regional and European context. It also identifies specific institutional and curricular gaps that can help in the development of targeted strategies to improve the integration of sustainable finance in economic education. The results were analysed using descriptive statistics and categorical frequency analyses, as well as correlation analysis and the non-parametric Spearman correlation and Pearson product-moment correlation.

Respondents rate the implementation of sustainable development in the Croatian economy as moderate, which is in line with their assessment of the implementation of these topics in higher education in the field of economics. This indicates that teaching staff at Croatian universities are aware that there is great potential for improving study programmes with more sustainable development topics. The study has shown that the topics of sustainable development are largely cross-curricular, which confirms the above statements. Although the majority of respondents publish scientific papers on the topic of sustainable development, regardless of whether they are involved in sustainable development projects.

Comparative analysis showed that sustainable development is more implemented compared to sustainable finance, which is in line with expectations and previous research. Even the presence of sustainable finance is somewhat more pronounced at the graduate level compared to undergraduate studies, but its integration remains largely fragmented and insufficiently specialized.

Respondents have published fewer scientific papers in the field of sustainable finance than in the field of sustainable development, which can be

explained by the fact that sustainable finance is a narrower field of research, even it is rapidly gaining in importance. Although the majority of respondents have not included learning outcomes related to sustainable finance in their courses, they state that a clear definition and inclusion of learning outcomes in a study programme would lead to a faster and more efficient implementation of sustainable finance in the study programmes.

The presentation of sustainable finance in teaching is only partially significantly related to the attitude towards the importance of sustainable finance for understanding sustainable development, but it is significantly related to the specific presentation of sustainable development at the faculty. Respondents who have spent a longer time abroad are more critical of the degree to which the concept of sustainable development and sustainable finance is implemented in the faculties/departments and in the economy as a whole.

The findings of this study contribute to the limited literature on education of sustainable finance and can serve as a methodological framework for comparative research in other countries. However, the findings need to be viewed in the context of the fact that there are certain limitations to the study. First of all, the study is presented within the framework of a single country context and is developed on the basis of the self-assessment or target group of finance teachers. Therefore, in the Croatian context, the sample is somewhat small.

From a policy point of view, it is recommended that the approach to curriculum change should be gradual and sequential, with learning outcomes linked to sustainable finance at an undergraduate level, along with the development of specialized courses at the graduate level. In this regard, there is scope for the Ministry of Science, Education, and Youth to play an important role through the inclusion of minimum standards with respect to the integration of sustainable finance/ESG competencies into the accreditation criteria for programmes, while allowing sufficient flexibility in implementation.

The systematic integration of sustainable finance into higher education is essential for building human capital capable of meeting the challenges of the green transition and ensuring the alignment of national policies with European sustainability goals and international climate commitments.

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## **PREMA ODRŽIVOM FINANCIRANJU: UNAPREĐENJE STUDIJSKIH PROGRAMA EKONOMSKIH FAKULTETA U HRVATSKOJ**

***Sažetak***

*Ovaj rad istražuje u kojoj su mjeri održivi razvoj i financije ugrađeni u nastavne i istraživačke aktivnosti te ispituje stavove nastavnika financija i percipiranu institucionalnu podršku za poboljšanje obrazovanja o održivosti na ekonomskim fakultetima i odjelima sveučilišta u Hrvatskoj. Rezultati ankete analizirani su korištenjem deskriptivnom statistikom, kategorijalnom frekvencijskom analizom Mann-Whitneyeva testa, t-testa i korelacija: neparametrijskom Spearmanovom korelacijom i parametrijskom Pearsonovom produkt moment-korelacijom. Nalazi istraživanja potvrđuju važnost ljudskog kapitala, odnosno ulogu nastavnika u primjeni i provođenju koncepta održivih financija/razvoja. Učinkovita primjena koncepta održivih financija u nastavni proces povezana je s institucionalno jasnim konceptom održivog razvoja, znanstvenim radom i studiranjem u inozemstvu. Uvođenje kolegija održivih financija više je prisutno na diplomskoj nego na preddiplomskoj razini, gdje se teme održivih financija postupno uvode u postojeće kolegije.*

***Ključne riječi: održive financije, ekonomski fakultet u Hrvatskoj, anketno istraživanje.***

***JEL klasifikacija: A13, A20, I23, G18, M14, Q56.***