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Roles of Personal Values and Information Technology Usage in Forming the University Students' View of Environmental Sustainability: A Preliminary Regional Study of Economics and Business Students

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Abstract: This study focuses on two significant factors shaping university students' perception of environmental sustainability. Those are (a) personal values, measured by the Portrait Values Questionnaire (PVQ) and (b) the usage of and proficiency in information technology. Personal values have been widely used to analyze individual perspectives toward various issues, including environmental ones. As contemporary social arrangements include significant influences from social networks and mobile phone usage, overall engagement with technology becomes an essential factor affecting university student attitudes and behaviors. While the individual impact of those factors can be found in the extant literature, we look into their interaction concerning university student pro-environmental attitudes, measured by the Revised NEP (New Ecological Paradigm) Scale, and their environmental self-efficacy. Our sample comes from the population of undergraduate business and economics students from Central and Southeast Europe, specifically Slovenia, Croatia, Bosnia and Herzegovina, Serbia, and Montenegro. We discuss our findings in the context of previous studies from the same regions and consider the unique socio-economic factors. The research results address Sustainable Development Goals 4 (quality education), 12 (responsible consumption and production), and 13 (climate action) by analyzing the factors contributing to university student pro-environmental attitudes and their self-efficacy in the context of their information technology usage and proficiency.

Keywords: personal values; information technology; university students; pro-environmental worldview; Central Europe; Southeast Europe



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1. Introduction

Environmental sustainability has become a relevant research topic in education due to the differences exhibited by Generation Z in their views of society and economy and the role of sustainability in socio-economic development. University students' attitudes and behaviors are influenced by multiple factors, especially information technology (IT) and its artifacts (computers, tablets, mobile phones, etc.), using different technologies, including e-mail, mobile messaging, social networks, and other applications. Their motivation patterns and value systems become heavily dependent on technology usage, which separates them from previous generations, especially regarding work-related behaviors [1,2]. For instance, as a value orientation, universalism implied by Schwartz's framework [3], referring to the understanding, appreciation, tolerance, and protection of human welfare, can be extended to the natural world. Namely, the extant research shows that individuals with a higher orientation toward universalism also show more concern for the natural environment and engage more in pro-environmental behaviors [4–6].

The rapid development of IT and its usage patterns among university students have significantly changed the ways and channels they use for acquiring, processing, and

distributing sustainability-related information. Social media enable the rapid dissemination of environmental information. They might be essential for university students' attitudes toward environmental sustainability [7]. However, an individual's level of engagement and the credibility of the information [8] also count as significant influences in this process. However, it is still unclear if university students have changed their perceptions of the 'real world' based on their digital interactions [9], how those technologies might transform personal values, and how value-based attitudes and behaviors emerge. Although the extant literature has demonstrated linkages and interactions among pro-environmental attitudes and behaviors and information technology, the empirical research has been focused on specific fields, such as travel and tourism [10], usage of 'green' ITs [11], and others.

A generalizable relationship could be expected since personal values could moderate the influence of IT on environmental attitudes and behavior. Individuals firmly committed to environmental sustainability might use technology to facilitate the search, production, and dissemination of digital content, reinforcing existing environmental concerns and vice versa. These expectations can be justified by the extant research on the role of social networks in shaping pro-environmental behavior [12,13], which supports our proposition that the underlying personal values could shape IT usage patterns.

This paper focuses on university students studying business and economics at the undergraduate, graduate, and PhD levels in the Central and Southeast European regions, including Slovenia, Croatia, Bosnia and Herzegovina, Serbia, and Montenegro. The socio-economic context and culture can be essential factors in ethical behavior [14]. Therefore, it is vital to understand how university students in countries that differ in cultural patterns and socio-economic factors, including EU membership, integrate the use of IT and the importance of personal values in forming attitudes and behaviors relevant to environmental sustainability.

We investigate the joint effect of personal values and IT use on university students' attitudes regarding environmental sustainability in Central and Southeast Europe. We hypothesize that both personal values and the use of IT influence pro-environmental attitudes and university students' feelings of self-efficacy, i.e., an individual's motivation and competency to take practical actions and solve prospective challenges [15]. This concept has been successfully applied to environmental issues by various authors [16].

The described research framework contributes toward the understanding of the regional implementation of United Nations Sustainable Development Goals—specifically SDG 4 (quality education), SDG 12 (responsible consumption and production), and SDG 13 (climate action) in higher education. The practical impact of our study toward the previously mentioned SDGs is confirmed by a choice of the business and economics student body since these students are expected to become future leaders in industry and government.

2. Theoretical Background

Personal values are fundamental guiding principles influencing an individual's attitudes and behavior. This study uses Schwartz's theory of human values, classifying individual values into ten sub-dimensions [3]. From the viewpoint of environmental sustainability, the most relevant sub-dimensions are universalism and benevolence, referring to the general provision of welfare to humanity, especially those belonging to one's social world [17]. The relevance of Schwartz's theory in explaining and predicting environmental sustainability has been confirmed by multiple psychological approaches and instruments, using the human values measurement as the underlying context of the pro-environmental attitudes and behaviors [18]. Therefore, it can be suggested that individuals, attaching importance to universalism are more inclined to exhibit pro-environmental attitudes and behavior, such as recycling, energy consumption, and support in developing and implementing environmental policies. This results from a connection between the values of universalism and benevolence and the ethical foundations of environmentalism, which looks to the natural environment as an actor with inherent rights comparable to human rights [19].

Information technology (IT) has become essential to everyday life and significantly shapes how individuals obtain, process, and disseminate information, including environmental issues. This study considered Hargittai and Hinant's analysis of the 'second level digital divide' [20]. They have shown differences among university students' online activities concerning socio-economic background. Those with more resources and higher education have used IT to obtain higher levels of social capital, with proficiency in IT serving as a mediator in selecting the types of online activities. Based on these results, we decided to measure the intensity of IT usage (the frequency and scope of IT usage and proficiency), i.e., the skills and efficiency with which individuals use individual IT solutions. These dimensions have a distinct but interrelated effect on how users process information and form attitudes.

The intensity of IT use refers to how often and to what extent individuals use IT platforms, including social media, digital news outlets, educational websites, and other digital media and content. The sheer amount of such content can lead to improved environmental knowledge and concern, depending on the amount and type of one's media susceptibility [21]. Nevertheless, poor-quality content, disinformation, or conflicting information may cause the opposite effect [22,23] and lead to environmental alarmism or mental distress concerning climate change and other environmental issues [24]. Therefore, a high level of technological proficiency is essential for critically assessing online content and identifying misinformation. Proficient users are more efficient in finding online content and more competent in assessing its credibility and using it in different contexts, including environmental activism. Extant research has shown a mirroring of the socio-economic status and social privileges from the 'offline' to the 'online world' [25], which also hints at the opportunity to reinforce the existing personal values and attitudes in online behavior.

Understanding the relationship between personal values and IT usage might help uncover the patterns forming university students' attitudes and self-efficacy perceptions concerning environmental sustainability. Personal values might be one of the factors determining the type of information individuals will seek, how they interpret it, and how they use it in their behavior and actions. Individuals valuing universalism might focus on obtaining information related to environmental concerns and become more actively involved in online communities, promoting sustainability [26]. Nevertheless, values need to be aligned with the perception of one's self-identity in order to influence environmental preferences, intentions, and behavior [27], which emphasizes the individual characteristics as a 'filter' of the value–technology relationship.

There could be additional theoretical contingencies in the discussed relationship, depending on the socio-economic context of Central and Southeast Europe, where this study was conducted. In this region, empirical evidence exists about the influence of personal values on forming pro-environmental attitudes and behavior [6,28]. Although there has been no previous empirical research on the role of IT usage patterns in the context of personal values and forming pro-environmental attitudes or self-efficacy, there are empirical insights into the negative social impact of the new technologies in Slovenia [29]. Those include feelings of loneliness and isolation and the excessive use of the Internet and smartphones, resulting in low involvement in social activities. On the other hand, empirical findings from a recent sociological study [30] suggest that the individual responsibility of Slovenian university students is heavily dependent on the use of digital technology. In addition, their responsibility can be linked to its social and environmental dimensions, but only on the behavioral level rather than values or intentions. This indicates that university students in Slovenia might not be aware of the environmental or social issues and priorities at the value level. However, they are still susceptible to relevant behavioral 'nudges' and can align their behavior with social and environmental responsibility patterns.

Within the analyzed region(s), there are significant differences among individual countries, such as Montenegro and North Macedonia, concerning university students' environmental knowledge and attitudes [31], which can be attributed to variations in educational systems and socio-economic factors. Although geographically close and be-

longing to the same cultural context, the two countries have developed diverse patterns of environmental awareness and safety practices among university students enrolled in higher education. Additional empirical evidence related to national specifics and the role of cultural and socio-economic context(s) can be found in Serbia, where environmental concerns related to small hydropower plants and lithium mining are currently positioned as a nexus of environmental and political activism. Within the anti-liberal and anti-globalization narratives, the activism movement seems to be oriented toward ‘eco-nationalism’, which can both support and hinder the internationalization of environmental protests [32]. While this study does not directly discuss the involvement of university students and the role of IT usage patterns in environmental protests, it certainly hints at the role of ecological concerns in national politics and shaping the socio-economic context in the Southeast European region. Environmental issues are a significant driver of political and socio-economic circumstances in the Central and Southeast European region(s), where digital content and communication channels have already proved influential in enhancing people’s environmental concerns through increased access to environmental information [33]. While the individual differences, based on demographic and socio-economic differences, persist, the role of IT tools and online media are critical drivers of university students’ environmental concerns and attitudes, providing the rationale for conducting a region-wide empirical study.

3. Materials and Methods

We used a cross-sectional survey design to explore the relationships between the previously discussed constructs (personal values, IT usage intensity and proficiency, environmental attitudes, and environmental self-efficacy perception) in more than ten institutions across ten countries belonging to the Central and Southeast European regions (Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, and Serbia). Our sample is non-random and has been based on the voluntary participation of economics and business school undergraduate, graduate, and PhD student bodies at participating universities (see Table 1). Although our results do not allow generalizations on the national population(s) level, they still inform the higher education faculty and policy-makers in Central and Southeast European regions of opportunities to foster students’ pro-environmental worldview.

Table 1. Structure of the study sample.

	Freq.	%	Valid %
University of Split (Croatia)	58	15.6	15.6
University of Dubrovnik (Croatia)	16	4.3	4.3
University of Ljubljana (Slovenia)	52	14.0	14.0
University of Maribor (Slovenia)	11	3.0	3.0
University of Banja Luka (RS B&H)	14	3.8	3.8
University of Mostar (FB&H, B&H)	60	16.1	16.1
University of Sarajevo (FB&H, B&H)	28	7.5	7.5
Other university (FB&H, B&H)	13	3.5	3.5
University of Nis (Serbia)	34	9.1	9.1
University of Montenegro (Montenegro)	81	21.8	21.8
Other university (Montenegro)	5	1.3	1.3
Total	372	100.0	100.0

Source: Results of the empirical research.

The decision to use economics and business school students is based on their future leadership roles, in which they will make decisions relevant to environmental sustainability in corporate, public, and nonprofit sectors. Such a sampling approach has already been used in extant empirical research across the same region(s) [34].

The research instrument was a comprehensive Web-based survey administered via the Qualtrics XM platform. We used the following measures in operationalizing the previously listed theoretical constructs:

- *Demographic information:* We collected limited demographic data voluntarily, including age, gender, country of residence, and academic status. We also asked participants to voluntarily provide data on their previous work experience, including managerial and entrepreneurial experience(s).
- *Personal values:* The Portrait Values Questionnaire (PVQ) was used to measure personal values. This is a short instrument that includes 40 values based on Schwartz's theory [3], measured by comparing oneself with a value-related statement by using a scale with six reference levels (from 1—described as 'Not like me at all' to 6—described as 'Very much like me'). PVQ is widely used to study the importance of values, including environmental sustainability [35,36].
- *IT usage intensity and proficiency:* IT usage intensity was based on the modified Twenge's screen time measurement scale [37]. IT proficiency was assessed using the general maturity model of IT adoption [38]. We modified the generic IT maturity stages (awareness, adoption, integration, and optimization of IT usage) by loosely following the classical approach of Nolan et al. [39]. The IT usage intensity (screen time) is measured on a five-point scale based on Twenge's previous research. The six-point IT proficiency scale incorporates measurement points based on interpreting the IT adoption maturity level and a single measurement point referring to the rejection of information technologies.
- *Environmental attitudes:* We measured the environmental attitudes using the Revised New Environmental Paradigm (NEP) Scale, a prevalent measure. The scale consists of 15 items, adopted from Dunlap et al. [40], and measured on the standard, five-point Likert scale.
- *Environmental self-efficacy:* Measurement of the construct was based on the Modified New General Self-Efficacy Scale, which included eight items, modified from Chen et al. [41] and employed the standard, five-point Likert scale.

Based on the theoretical framework and literature review, the study was guided by the following research questions:

- To what extent do personal values influence environmental attitudes among business and economics university students in Central and Southeast Europe?
- How do the IT usage intensity and proficiency relate to the formation of environmental attitudes and perceptions of environmental self-efficacy in this demographic?

Data was collected, and the survey link was distributed through the course management systems of the participating regional public higher education institutions of economics and business. Participation was voluntary and based on the informed consent of the participants. Provision of demographic data was optional. No personally identifiable information was collected, including the personal details or IP addresses from which the survey was accessed.

Since there were no specific inclusion (or exclusion) criteria, the obtained sample is non-random and cannot be used for generalizations or comparisons at the national level(s). Due to the participant self-selection and participation of selected higher education institutions, there are limitations in the generalizability of the obtained results concerning gender and age biases of national subsamples, which are further discussed in the following section. In addition, respondents with an already existing interest in environmental and technology issues might have been motivated to participate in the survey, which could also limit the generalizability of the empirical results.

4. Results

Compared to other empirical studies concerning ethics, social, and environmental responsibility in the same region(s) [34], female participants (75.7%) are overrepresented in the sample. Male participation (24%) is generally lower in online social science surveys, and data collected in such studies cannot be assumed to be free from gender bias [42]. One participant (0.3%) declared themselves to be gender-neutral. The mean age of our participants was 23.86 years (with a standard deviation of 5.69 years), which was expected since

223 participants (61.3% of the sample) studied at the undergraduate level, 102 participants (28%) were graduate students, and 39 participants (10.7%) study at the 3rd Bologna cycle level. Most participating students (78.9%) have some form of work experience, only 15.5% have managerial experience, and 12.5% have experience with an entrepreneurial venture.

There are variations in the sample's demographic characteristics across the five countries. Gender bias, which has been acknowledged at the entire sample level, varies across countries, with the lowest participation of male participants in Serbia (11.8%), Bosnia and Herzegovina (RS) 14.3%, and Croatia (15.5%). Gender bias is much lower in Montenegro (30.2% of male participants) and Slovenia (39.7%). The majority of surveyed university students study at the undergraduate level. However, there are regional variations, from 24.1% in Montenegro, 40% in Croatia, 71.4% in Slovenia, and 82.5% in Bosnia and Herzegovina (FB&H) to 100% of the sample in Serbia and Bosnia and Herzegovina (RS). The Croatian subsample is specific due to the dominance of the master (second cycle) students (60%), with the Slovenian (27%) and Montenegrin (36.1%) subsamples also characterized by the high levels of master student participation. In addition, the Montenegrin subsample also has a very high level of PhD (third cycle) student participation (39.8%). Consequently, the mean age of the survey participants from Serbia (19 years) and Bosnia and Herzegovina (RS) (22.71) is lower than in other countries, especially Montenegro (25.78 years) and Slovenia (26.84). Table 2 shows regional variations concerning work, managerial, and entrepreneurial experience. The variations are expected concerning age and study enrollment differences among the participants across the region.

Table 2. Variations of the work, managerial, and entrepreneurial experience across the study sample.

Country (Including Political Entities)	Work Experience			Managerial Experience			Entrepreneurial Experience		
	Freq.	%	Valid %	Freq.	%	Valid %	Freq.	%	Valid %
Slovenia	60	95.2	95.2	15	23.8	23.8	5	7.9	7.9
Croatia	64	90.1	91.4	6	8.5	8.7	8	11.3	11.6
Bosnia and Herzegovina (FB&H)	65	62.5	63.7	16	15.4	15.7	14	13.5	13.7
Bosnia and Herzegovina (RS)	6	42.9	42.9	0	0	0	1	7.1	7.1
Montenegro	79	91.9	91.9	19	22.1	22.4	15	17.4	17.4
Serbia	17	50.0	50.0	1	2.9	2.9	3	8.8	9.1

Source: Results of the empirical research.

Table 3 shows the descriptive statistics for the PVQ-based measurement of personal values, demonstrating the prevailing value dimensions of benevolence (4.91), universalism (4.84), and self-direction (4.79).

Table 3. Descriptive statistics for personal values (PVQ-based measurement).

Value Dimension	Mean	Std. Dev.
Self-direction	4.7944	0.80517
Stimulation	4.2339	1.08301
Hedonism	4.2970	1.06453
Achievement	4.3763	1.01911
Power	3.6707	1.06956
Security	4.7567	0.94916
Conformity	3.8091	0.97951
Benevolence	4.9086	0.73951
Universalism	4.8405	0.76201
Valid N	372	

Source: Results of the empirical research.

Table 4 shows the descriptive statistics for the variables, measuring the constructs of IT usage and proficiency, environmental attitudes, and self-efficacy. While the screen

time is very high across the participants (with a mean of 4.38 and a standard deviation of 0.883—measured on the five-point scale), the IT proficiency is still considerable, but with a higher variance (with a mean of 4.28 and a standard variation of 1.21—measured on the six-point scale). Both environmental attitudes and self-efficacy scores are average (with respective means of 3.43 and 3.49 and standard deviations of 0.42 and 0.67—measured on the five-point Likert scale).

Table 4. Descriptive statistics for IT usage and proficiency, environmental attitudes, and self-efficacy.

Construct	Mean	Std. Dev.
Environmental attitudes	3.4263	0.41760
Environmental self-efficacy	3.4879	0.66930
IT usage (screen time)	4.38	0.883
IT proficiency	4.28	1.212
Valid N	372	

Source: Results of the empirical research.

In the next step of the empirical analysis, we calculated the linear correlations among the study constructs to identify any significant associations and determine whether further statistical analysis might be helpful. Table 5 shows the values of Pearson linear correlation coefficients for all relevant variable groups (we do not report on the inter-relationships among the personal values since these results are outside the study scope). Results confirm the theoretical expectations of the positive and statistically significant associations between universalism and environmental constructs, although the strength of the association is low to moderate.

Table 5. Linear correlations among study constructs (Pearson coefficient values).

Variable	Env. Attitudes	Env. Self-Efficacy	IT Usage	IT Proficiency
Self_direction	0.077	0.218 **	0.218 **	0.007
Stimulation	−0.029	0.155 **	0.155 **	−0.006
Hedonism	−0.007	0.045	0.045	−0.023
Achievement	0.065	0.111 *	0.111 *	0.116 *
Power	−0.014	0.004	0.004	0.063
Security	0.023	0.102 *	0.102 *	−0.132 *
Conformity	−0.132 *	0.033	0.033	0.037
Benevolence	−0.043	0.164 **	0.164 **	0.007
Universalism	0.244 **	0.227 **	0.227 **	−0.015
Env. attitudes	-	0.107 *	0.112 *	0.154 **
Env. self-efficacy		-	−0.012	0.106 *

Source: Results of the empirical research. Note: * Correlation is significant at 0.05 level. ** Correlation is significant at 0.01 level.

There is also a logical negative and significant association of conformism with environmental attitudes and a positive and significant correlation of self-direction, stimulation, and benevolence with environmental self-efficacy. IT-related constructs are positively and significantly correlated to environmental attitudes, with environmental self-efficacy significantly associated with IT proficiency, although with a meager strength.

Simple linear regression was further used to assess the existence and to verify our presumptions about the causality of relationships among the personal values and IT-related constructs in predicting environmental attitudes and self-efficacy. In the first model (Model 1), we used personal values and IT-related constructs (usage and efficiency) as predictors of environmental attitudes (Model 1). In the second model (Model 2), we used the same predictors to predict environmental self-efficacy.

As demonstrated by Table 6, Model 1 explained 14.1% of the variation in environmental attitudes and has been significant at the 1% level ($F = 5357, p < 0.01$).

Table 6. Evaluation of simple linear regression for Model 1.

Model	R ²	Adjusted R ²	F	df (Regr., Res.)	p
Model 1	0.141	0.114	5357	11, 360	<0.001

Dependent variable: Environmental attitudes. Source: Results of the empirical research.

The evaluation of linear regression coefficients is shown in Table 7. Consistent with the study's theoretical background, universalism is the strongest predictor of environmental attitudes ($\beta = 0.325, p < 0.001$). Conformity ($\beta = -0.153, p = 0.009$) and benevolence ($\beta = -0.124, p = 0.039$) have a negative relationship to the dependent variable, which could be explained by the conflict of the traditional social norms and behaviors, resistance to change them, and the focus on the immediate social contacts, with the values and requirements of developing environmental values. IT proficiency is also positively linked to environmental attitudes ($\beta = 0.126, p = 0.024$), with the multiple routes of potential interaction between the constructs. Those include better access to environmental information in the electronic channels for more proficient users, a higher level of user engagement in social networks and other digital platforms, improvement of proficient users' competencies for environmental advocacy and action, and better opportunities for collaboration with like-minded groups and individuals.

Table 7. Evaluation of linear regression coefficients for Model 1.

Predictor	B	Std. Error	β	t-Value	p-Value
Constant	2.884	0.222	-	12.971	0.000
Self-direction	-0.008	0.029	-0.016	-0.278	0.781
Stimulation	-0.030	0.022	-0.079	-1.389	0.166
Hedonism	-0.006	0.021	-0.015	-0.279	0.780
Achievement	0.036	0.025	0.087	1.412	0.159
Power	-0.023	0.023	-0.060	-1.023	0.307
Security	0.012	0.026	0.028	0.481	0.631
Conformity	-0.065	0.025	-0.153	-2.625	0.009
Benevolence	-0.070	0.034	-0.124	-2.067	0.039
Universalism	0.178	0.032	0.325	5.565	0.000
IT usage	0.035	0.026	0.073	1.348	0.178
IT proficiency	0.043	0.019	0.126	2.274	0.024

Dependent variable: Environmental attitudes. Source: Results of the empirical research.

The same set of predictors was used to predict the perceptions of environmental self-efficacy in Model 2. Evaluation of the model (provided by Table 8) shows its statistical significance at the 1% level ($F = 3749, p < 0.01$), although with a low explanatory power ($R^2 = 0.103$).

Table 8. Evaluation of simple linear regression for Model 2.

Model	R ²	Adjusted R ²	F	df (Regr., Res.)	p
Model 2	0.103	0.075	3749	11, 360	<0.001

Dependent variable: Environmental self-efficacy. Source: Results of the empirical research.

Table 9 analyzes regression coefficients for the analyzed Model 2, predicting environmental self-efficacy. There are three statistically significant predictors in Model 2: (a) the personal values of universalism ($\beta = 0.137, p = 0.022$) and self-direction ($\beta = 0.124, p = 0.034$) and (b) IT proficiency ($\beta = 0.132, p = 0.020$). The routes of personal value influence on environmental self-efficacy include an ethically driven motivation and the perceived impact of one's environmentally oriented values, which are linked to universalism.

Table 9. Evaluation of linear regression coefficients for Model 2.

Predictor	B	Std. Error	β	t-Value	p-Value
Constant	1.877	0.364		5.155	0.000
Self-direction	0.103	0.048	0.124	2.132	0.034
Stimulation	0.047	0.036	0.076	1.308	0.192
Hedonism	−0.035	0.035	−0.056	−1.008	0.314
Achievement	0.048	0.042	0.073	1.154	0.249
Power	−0.047	0.038	−0.076	−1.261	0.208
Security	0.001	0.043	0.002	0.032	0.975
Conformity	0.001	0.041	0.001	0.020	0.984
Benevolence	0.070	0.056	0.077	1.251	0.212
Universalism	0.121	0.052	0.137	2.305	0.022
IT usage	−0.049	0.042	−0.065	−1.165	0.245
IT proficiency	0.073	0.031	0.132	2.340	0.020

Dependent variable: Environmental self-efficacy. Source: Results of the empirical research.

The arguments for the potential influence of IT proficiency on self-efficacy might be compared to those previously listed for Model 1 (i.e., the case of environmental attitudes). IT efficiency can also be linked to the personal value of self-direction, implying high levels of autonomy, personal initiative, and advanced and unconventional problem-solving skills, which might appear in self-directed individuals. These influences could enhance personal agency and engagement with environmental behaviors, empower individuals to act proactively, and even lead others in the same direction.

5. Discussion

The empirical results presented in the previous section address two research questions concerning the influence of personal values and IT usage and proficiency patterns on forming environmental attitudes and self-efficacy. The theoretical background and the empirical results tie into the bigger picture of building the pillars of sustainable academic communities, which aim to achieve environmental responsibility, resilience, and economic sustainability. One can connect the pillars to sustainable higher education principles and practices based on Monteiro et al.'s [43] five-pillar approach—People, Planet, Prosperity, Peace, and Partnerships. The People pillar focuses on quality education and social well-being, which are expected as roles and outcomes of higher education in achieving sustainable development. The Planet pillar is concerned with the protection of the natural environment, while the Prosperity pillar emphasizes sustainable economic growth. Together, they support efforts to achieve energy and resource independence and reduce the carbon footprint of higher education. In the long term, they need to create green job opportunities and the skills and competencies to be used to transition toward the green economy.

Although the strengths of relationships have not been exceptionally high, we have empirically confirmed the linkages among the constructs of personal values, IT usage, and proficiency with the environmental attitudes and self-efficacy of university students in the selected countries of Central and Southeast European region(s). Our results are aligned with Schwartz's theory of human values, which suggests that universalism can be linked to the environmental worldview due to the perception of a moral obligation toward the natural world [17].

Conformity was negatively linked to environmental attitudes and self-efficacy, which can be explained by the orientation toward social welfare for one's close social contacts and group(s). This finding aligns with the empirical results of Katz-Gerro et al. [44], who established that the joint effects of universalism and benevolence do not need to show significant effects on environmentally oriented behavior. In addition, the same study confirms that social conformity also varies in terms of its influence on environmental behavior, depending on the socio-cultural context, in countries such as Germany, Israel, and Korea. In the socio-economic context of Central and Southeast Europe, the traditional

values and norms could be, therefore, in conflict with the environmental orientation, which requires different social, economic, and educational interventions aimed at university students. There is also a realistic chance of formulating such interventions around the personal value of conformity, as demonstrated by Ruan et al. [45].

Self-direction was identified as a significant predictor of environmental self-efficacy, which can be explained by the role of an independent mind and its engagement in individual confidence to engage in environmental behavior, advocacy, and activism. This finding suggests that critical thinking, personal autonomy, and initiative should be incorporated into the environmental interventions directed toward university students in the analyzed region(s). This is in line with the findings of Cooke and Fielding [46], who argue that environmentally oriented behavior should be both pleasant and intrinsically gratifying. Such an outcome can be achieved by transforming the perception of environmentally oriented behavior from an inconvenience, or even a burden or a duty, toward a fun and socially rewarding activity, affirming the knowledge and competencies of university students.

Our overall results are also supported by the conventional analysis of the positive influence of universalism and self-direction on environmental attitudes, with the mixed influence of benevolence and the negative influence of conformity [17], although it should be noted that the cultural context also needs to be considered [47]. The implications for educational and other interventions confirm the importance of personal values, cultural sensitivity, and critical thinking as significant aspects of environmental interventions. In addition, educators and policy-makers throughout Central and Southeast Europe should reference university students' local communities and sense of belonging when designing environmental interventions. As shown by Uzzell, Pol, and Badenas [48], identification with the local community and high levels of social cohesion can be linked to strong collective environmental action. Self-direction, benevolence, and conformity values should be linked to enhancing social capital and cohesion in the context of university students' local communities and fostering their capacity for collective action. This dimension of the environmental interventions links the field to the discussions on community capacity and sense of community. The extant literature [49] recognizes significant empirical differences across local communities in Croatia and Serbia, suggesting that regional and national characteristics should be acknowledged by designing relevant and targeted interventions.

Individuals with higher levels of IT proficiency can find, create, and engage with environmental content in digital channels, communicating pro-environmental messages and promoting environmentalism in the digital world. There is also a statistically significant relationship between IT proficiency and environmental self-efficacy, which could be explained using the comparable mechanism(s), as in the case of environmental attitudes. This finding suggests that improving digital skills and competencies and eliminating different aspects of the digital divide could serve as important aspects of environmental interventions directed at university students.

While the obtained empirical results are well aligned with the extant theoretical background, rooted in Schwartz's theory of personal values, our contribution concerns the analysis of environmental issues in the context of morality and moral identity [50], as well as the potential of IT proficiency to influence the university students' environmental attitudes and self-efficacy. In this context, the digital divide also drives socio-economic differences concerning environmental sustainability, which extends its analysis in the extant literature [20]. Economics and business student population is uniquely positioned to advance sustainable development, due to their dynamic and interchangeable roles as learners and change agents. Our findings show the interplay of personal and technological factors ties back to Monteiro et al.'s [43] concepts of key pillars, serving as catalysts for building sustainable academic communities. By promoting and associating the moral aspect(s) of natural sustainability and digital literacy, business schools can empower students to tackle complex sustainability challenges. This not only prepares them for the future but also pushes society toward new goals that align with the SDGs, especially those concerning

quality education (SDG4), responsible consumption and production (SDG12), and climate action (SDG13).

This study has inherent limitations related to its cross-sectional design and the non-random sample selection. Although it does not guarantee generalizability, such a study design is appropriate for preliminary empirical research to identify future research themes and direction. In addition, conducting the study in Central and Southeast European regions (s) further limits the study to countries of a similar cultural background and comparable socio-economic context. Therefore, further research should look into the opportunities to replicate the study in various cultural and socio-economic contexts, accounting for additional factors that might influence environmental attitudes and self-efficacy. This could primarily depend on the national political [51], cultural [52], socio-economic [53], and inter-generational contexts [54]. In addition, longitudinal tracking of the current generation of university students should be considered as a potential route for future research, which might enhance the generalizability of the initial empirical findings presented in this study.

6. Conclusions

The objectives of this study were to provide a preliminary empirical analysis of the roles of personal values and information technology usage and proficiency in forming university students' environmental worldviews. Our empirical results are aligned with the study objectives and contribute to the extant literature by introducing new predictors of university students' environmental attitudes and self-efficacy. Selected personal values and IT proficiency have been confirmed as significant constructs, which are also relevant for designing educational and behavioral environmental interventions. Due to the multiple limitations of this preliminary study, we recommend future research directions concerning the replication of this study in different contexts, using longitudinal and comparative approaches.

Our results affirm the need to focus on university students' values of universalism and benevolence and consider the traditional norms and behavioral patterns, which the value of conformity could support. We have demonstrated that IT-enhancing interventions can also improve university students' orientation toward environmentalism and their environmental self-efficacy. Such interventions should also aim to remove critical barriers, contributing to equitable access to new technologies, skills gaps in using them, and other aspects of the digital divide.

This study has demonstrated the importance of pro-environmental attitudes and IT skills aligned with SDG 4 (quality education). We show how value-based learning and technology-enhanced education can improve environmental awareness and self-efficacy. By identifying ways to encourage positive attitudes and perceptions of self-efficacy concerning sustainable consumption patterns (SDG 12) and climate action (SDG 13), our research adds to our understanding of how education and digital engagement can help future leaders promote sustainability goals.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su16229830/s1>, File S1: Data.

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