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Exploring the factors shaping business students' environmental concern

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Abstract

Purpose – Increasing the need for education for sustainable development in universities requires an understanding of the predictors of students' environmental concern (EC). In this paper, the authors focus on the EC of business students because of their future responsibility for business operations regarding the exploitation of natural resources. The aim of the study is to examine the predictors of business students' environmental concern.

Design/methodology/approach – Based on the Norm Activation Model as the theoretical framework, this study hypothesizes the model of EC with two main predictors: ascription of responsibility for the environment (AOR), driven by locus of control and self-efficacy (LC/SE), and awareness of positive consequences of consumption reduction on the environment (AOC), driven by perceived environmental knowledge. Structural equation modelling was applied to confirm the conceptual model based on the responses of business students from six countries (Czech Republic, Croatia, Hungary, Poland, Slovakia and Spain) collected through an online survey.

Findings – The environmental concern of business students is predicted both by the ascription of responsibility and by awareness of consequences; however, the ascription of responsibility is a stronger predictor of EC. A strong impact was found for internal locus of control and self-efficacy on AOR, as well as a weaker influence of perceived environmental knowledge on AOC.

Originality/value – Sustainability education dedicated to business students should provide environmental knowledge and strengthen their internal locus of control and self-efficacy in an environmental context.

Keywords Environmental concern, Perceived environmental knowledge, Awareness of consequences, Locus of control, Self-efficacy, Ascription of responsibility

Paper type Research paper

1. Introduction

Anthropogenic climate changes shaped by human causal factors put pressure on organizations and countries to reduce their environmental impact and implement a greener transformation of economies (Cheba *et al.*, 2022). Consequently, teaching sustainability in business higher education is of crucial importance (Chiang and Chen, 2022). There is a need to emphasise the importance of educating a new generation of sustainable-oriented business

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leaders. However, it is a challenge to incorporate sustainability issues into managerial education (Lee and Hales, 2022).

The fundamental prerequisite in green transformation is to raise the level of environmental concern (EC) in societies, which is often considered a predictor of pro-environmental behaviour (Ghaffar *et al.*, 2023), aiming to reduce environmental damage (Li *et al.*, 2021). Environmental concern refers to a general personal attitude that reflects an individual's concerns and anxieties regarding the environment, as well as the consequences of environmental modifications and their impact on the lives of present and future generations (Abdul-Muhmin, 2007). Environmental concern can be described as people's perception and conviction that humans represent a danger to the natural environment, at the same time being willing to protect it (Fransson and Gärling, 1999). EC may be defined from two perspectives:

(1) as concern about the quality of air, water and soil in the natural environment and the harmful effects of human activities; and

(2) as an individual evaluation of the environmental consequences of one's own behaviour both in private and in professional lives.

The definition of environmental concern as people's attitudes is related to previous study results showing that EC both directly (Ahmad *et al.*, 2019; Hedlund, 2011) and indirectly (Li *et al.*, 2019) underpins and determines pro-environmental behavioural intentions and behaviour itself.

Specialists in economics and management quite often deal with business activities based on natural resource usage (possession, processing and sale) and their decisions impact the environment to a large extent. It is vital to increase the environmental concern of business students if they are supposed to act in favour of the environment in the future, especially in their business decision-making. To increase the level of environmental concern, a greater educational emphasis is necessary, especially in higher education institutions (HEIs) (Berchin *et al.*, 2021). An understanding of the predictors of business students' environmental concern is needed to implement environment-focused issues into the curriculum, this being a foundation of the education process describing educational outcomes (Etse and Ingley, 2016). To do so, we implement the Norm Activation Model (NAM; Schwartz, 1977), which is widely used for explaining pro-social behaviour (pro-environmental is regarded as such). In this theory, norm activation begins with an individual's awareness of conceivably detrimental consequences and his or her ascription of responsibility for the state of the environment. We go a step beyond by considering environmental concern as an attitude towards the environment.

We conducted a research survey among business students to test the hypotheses regarding EC predictors: ascription of responsibility, driven by *locus* of control and self-efficacy, and awareness of consequences, driven by perceived environmental knowledge. Then, structural equation modelling (SEM) was applied for data analysis.

The structure of the paper is as follows. After discussing reasons for selecting the theoretical framework of the study in Section 1, we develop the research hypotheses and the model of environmental concern predictors in Section 2. Then, we present the research method in Section 3 and results in Section 4, which is followed by a discussion, theoretical and practical implications and limitations in Sections 5, 6 and 7, respectively.

2. Literature review and conceptual framework

2.1 Education for sustainability in business higher education

Education for sustainability (ESD), in the sense that it "empowers learners (. . .) to take informed decisions and responsible actions" (UNESCO, 2022), should promote environmental

awareness and create the need for good habits (Berchin *et al.*, 2021) and shape students' competencies (Price *et al.*, 2021). Sustainability competence as an enabler for addressing sustainability challenges comprises three classes:

(1) understanding sustainability;

(2) skills such as critical, creative and system thinking about sustainability, empathetic and interdisciplinary; and

(3) attitudes such as commitment to sustainability, respect for all generations (Faham *et al.*, 2017).

Education for sustainability should also equip students with interdisciplinary knowledge, as all disciplines are relevant (Price *et al.*, 2021). The higher education sector, as a key player in the production and dissemination of knowledge, is a crucial actor in implementing sustainability in societies (Etse and Ingley, 2016; Hill and Wang, 2018; Berchin *et al.*, 2021; Price *et al.*, 2021).

Education for sustainability requires an understanding of how sustainability can be implemented in the curricula (Hill and Wang, 2018; Berchin *et al.*, 2021; Price *et al.*, 2021). This implementation is challenging because of the intricate nature of sustainability and the imperative to foster critical thinking and introduce conflicting and unfamiliar perspectives (Sass *et al.*, 2022). Sustainability learning outcomes could become a part of general education and independent courses with sustainability-related content (Etse and Ingley, 2016; Hill and Wang, 2018). The incorporation of sustainability content can be diversified among courses and units, depending on the individual preferences of teachers and on the nature of the course (Poon, 2017).

The scale of incorporating the sustainable development concept into HEI curricula (Sammalisto *et al.*, 2016) is growing (Lozano *et al.*, 2019). This process of including competencies for sustainable development into curricula is especially needed in business-related higher education (Chiang and Chen, 2022). Typically, the basic courses in business higher education, such as microeconomics and management, do not include sustainability issues directly, as they focus on the profit-seeking aspects of organizing businesses (Gawel *et al.*, 2022).

Built on the logic of profit-seeking, the efficiency paradigm shapes businesses worldwide, often aiming to operate with the lowest costs, which, in fact, generate "externalities". The problem of externalities is discussed in courses on microeconomics (Begg *et al.*, 2020; Varian, 2019), which include, among other types, the environmental effects. Externalities are positive or negative side effects impacting a third party; in other words, unpriced costs or benefits caused by a company and affecting other companies, consumers and society. Business students might raise the problem of the environmental impact of companies in the context of externalities. However, the typical discussion during the course of microeconomics is about how to evaluate and price externalities rather than how to address or remove them.

In business higher education, courses on environmental management are the closest to education for sustainable development, as they focus on processes, tools and instruments to manage environmental resources in a more sustainable way (Leal Filho, 1997). However, this course is not necessarily mandatory or a prerequisite for all business students in all our surveyed reference countries.

The integration of sustainability into the curricula of business higher education faces some challenges, such as the complexity of perspectives related to the interplay of environmental, social and economic pillars (Sass *et al.*, 2022), as well as organisational obstacles associated with being a part of general education or independent courses (Etse and

Ingley, 2016; Poon, 2017; Hill and Wang, 2018). For instance, in basic courses the environmental concern may be addressed through discussions about issues such as the scarcity of resources, including natural resources, the pricing of natural resources because of increased demand or environmental taxes (Gawel *et al.*, 2022). However, addressing environmental concern involves the challenge of balancing productivity and sustainability. To promote a more sustainable approach, businesses should aim to reduce their production levels and encourage consumers to consume less, which can be conflicting with a profit-oriented business approach.

2.2 Theoretical framework

Education for sustainability should seek effective learning outcomes that lead to behaviour change (Shephard *et al.*, 2015). Current psychological theorizing shows the central meaning of a person's regulative thought for their own behaviour, expressed in the social cognitive theory, in which people's agency is described by the following personal attributes: intentionality, forethought, self-reflectiveness and self-reactiveness (Bandura, 2001). Other theories, such as the theory of reasoned action (Fishbein and Ajzen, 1975) and the theory of planned behaviour (Ajzen, 1991), posit a person's behaviour as predicted mainly by their behavioural intention, determined by perceived social pressure (subjective norms) and personal attitude. This reflects the importance of attitude in shaping behaviour.

Environmental concern (EC) – a key concept in this study – has been a widely accepted concept in research on pro-environmental consumers' behaviour for almost 50 years (Weigel and Weigel, 1978; Fransson and Gärling, 1999; Chen *et al.*, 2022). EC is typically recognised as a predictor of environmental friendly behaviour; individuals who are more sensitive towards the environment are more likely to make pro-environmental purchasing decisions (Ghaffar *et al.*, 2023) to reduce environmental harm (2021; Li *et al.*, 2021). EC is defined as a general attitude which reflects how much a person cares and worries about the environment, as well as the consequences of environmental changes and their influence on current and future generations' lives (Abdul-Muhmin, 2007). This definition emphasises the altruistic and pro-social aspect of EC, as it takes into consideration not only one's own business but also the interests of others and potentially generates behaviour beneficial to others.

To find internal sources of pro-environmental concern, the NAM was applied in this study as the main theoretical framework. NAM, developed by Schwartz (1977), was established to explain the possible internal sources of altruistic motivation and behaviour, as it is altruistic only to the extent that it is motivated by internal values (Schwartz, 1977). Initially, NAM was used to explain the motives for altruistic activities not related to the environment, such as volunteering (Foster *et al.*, 2022), but later, numerous researchers successfully used NAM for examining pro-environmental motivation. For example, NAM was applied by Tang *et al.* (2021) to examine the pro-environmental behavioural intention of farmers, by Foster *et al.* (2022) in explaining the pro-environmental behaviour of employees in the workplace, by van der Werff and Steg (2015) in investigating energy-saving behaviour and by Shin *et al.* (2018) while examining consumers' intention to choose organic menu items at restaurants.

According to NAM, altruistic behaviour is driven by a feeling of personal obligation to take a specific action (personal norm) and is determined by two main factors: awareness of consequences (AOC) and ascription of responsibility (AOR). AOC is identified as an ability to become aware of the consequences of one's behaviour for others: the more people are aware of the consequences of their behaviour, the more likely they internalize a feeling of obligation to act in a way interpersonally beneficial to their personal norm (Schwartz, 1977). AOR is defined as a feeling of responsibility for the negative consequences of behaving in a way not favourable to others (De Groot and Steg, 2009). Although NAM has been applied in numerous

research studies with very good results – its explanative power was found to be strong – the nature of the relationships between personal norm awareness of consequences and ascription of responsibility has been under discussion for a long time (Stern *et al.*, 1999; De Groot and Steg, 2009). By origin, NAM is based on the assumption that the personal norm is determined by two factors: AOC and AOR. Later studies interpreted NAM as either a moderator model or a mediator one. In the former, both AOC and AOR moderate the impact of the personal norm on altruistic, pro-social behaviour. In the latter model, AOR mediates the influence of AOC on the personal norm, which in turn influences pro-environmental behaviour. This mediation model was applied by Stern *et al.* (1999) in their Value–Believe–Norm theory, which may be regarded as an extension of NAM. In the current study, a moderator model was tested to explain the direct impact of both AOR and AOC on EC, which we interpreted here as a form of personal norm – a kind of attitude towards environmental problems (Hansla *et al.*, 2008; Hedlund, 2011). To find a more specific explanation of EC predictors, we applied an extended version of NAM in which two additional variables were included: perceived environmental knowledge (PEK) and *locus* of control integrated with self-efficacy (LC/SE).

2.3 Hypotheses development

2.3.1 Ascription of responsibility. The concept of ascription of responsibility is one of the two main activators of the altruistic personal norm (Schwartz, 1977). As a driver of the pro-environmental personal norm, it refers to an individual feeling of one's responsibility for the consequences on the environment of one's behaviour (Stern *et al.*, 1999; Fang *et al.*, 2019;). In the case of pro-environmental behaviour, or lack thereof, the problem of responsibility may be enhanced by the perceived weak visible impact of an individual behaviour on the state of the environment. Still, the effect of AOR on pro-environmental behaviour (Fang *et al.*, 2019), and the pro-environmental personal norm (Han, 2015), was shown in previous research. It allows us to formulate the following hypothesis:

H1. Business students' ascription of responsibility for the environment is positively related to their environmental concern.

2.3.2 Locus of control and self-efficacy. Locus of control is the term for the concept of internal versus external control of reinforcement (Kormanik and Rocco, 2009). Individuals with an internal LC believe they have command over events occurring during their lives, whereas ones with an external LC think that everything that happens to them is determined by forces they are unable to control (Cleveland and Kalamas, 2015). LC is closely related to self-efficacy (SE), which is understood as an individual's belief in their ability to complete certain tasks successfully (Bandura, 1977) to produce a desired result in a specific area (Ajzen, 2002). Internal environmental LC denotes an individual's attitude regarding personal responsibility towards and ability to affect environmental outcomes (Cleveland *et al.*, 2012). Previous research, though inconsistent to some extent, proved that internal environmental LC and SE significantly predicts environmental concern (Gamba and Oskamp, 1994), so in the current study, the following hypothesis was formulated:

H2. Business students' internal environmental locus of control and self-efficacy are positively related to their ascription of responsibility for the environment.

2.3.3 Awareness of consequences. According to the definition, the more an individual is aware of the consequences of their behaviour on others, the more likely they will be to take these consequences into consideration when deciding how to behave. To behave pro-environmentally, one needs some knowledge about the consequences of a given behaviour.

According to De Groot and Steg (2009), who conducted research on pro-social behaviour activators, AOC should be interpreted as whether someone is aware of not all but only the negative consequences for others when not acting pro-socially. Hansla *et al.* (2008) suggest that AOC expresses awareness of the potential future state of the environment. Previous research results showed a direct link between AOC and environmental concern (Hansla *et al.*, 2008) or the personal norm concerning pro-environmental behaviour (Lind *et al.*, 2015). In the current study, AOC refers to the consequences of limiting consumption behaviour and we assumed that it influences EC, so the third hypothesis of the current study is formulated as follows:

H3. Business students' awareness of consequences is positively related to their environmental concern.

2.3.4 Perceived environmental knowledge. Previous research showed that knowledge in general is related to environmental concern (see Figure 1). The perceived environmental knowledge (PEK) was proven to influence the environmental concern of young British citizens (Lyons and Breakwell, 1994). Xiao *et al.* (2013) found that education was a powerful predictor of environmental concern among the Chinese. Li *et al.* (2019) proved that PEK was a good predictor of attitude towards pro-environmental behaviour. Recognizing the complexity of environmental knowledge, which can lead to cognitive illusions and biases (Nicholls, 1999), as well as the risk of business students overestimating their abilities in this domain despite being unskilled (Kruger and Dunning, 1999), we refer to PEK, which is understood as an individual's self-reported understanding and knowledge of environmental issues (Li *et al.*, 2019). In the current study, we assume that PEK may influence EC indirectly, but it may be mediated by AOC. For this reason, the fourth hypothesis was formulated as follows:

H4. Business students' perceived environmental knowledge is positively related to their awareness of consequences.

3. Method

To verify our conceptual model and to test the hypotheses, data was collected during April–June 2021. The study was carried out by a self-administered questionnaire. The first part

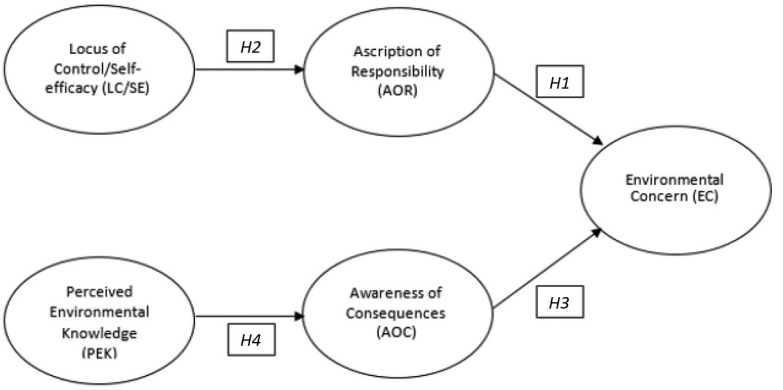

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Figure 1.
Determinants of environmental concern – research model

contains questions on five factors: locus of control/self-efficacy (LC/SE), ascription of responsibility (AOR), perceived environmental knowledge (PEK), awareness of consequences (AOC) and environmental concern (EC). Participants referred to statements on a seven-point scale (1 = strongly disagree to 7 = strongly agree). A complete list of questions and sources is presented in Table 1. The second part of the questionnaire consists of questions about respondents' personal information.

The participants in the study included 2702 (N = 2702) respondents – students of economics and management. The questionnaire was placed in the cloud, participants received a link to the survey. Respondents' average age was 22.1 years (SD = 3.63, min = 18, max = 66). The study participants comprised 1,574 women (58.2%), 1,099 men (40.7%) and 29 participants who refused to provide their gender (1.1%). A total of 481 (17.8%) participants were from Poland; 401 (14.8%) from Hungary; 588 (21.8%) from the Czech Republic; 430 (15.9%) from Croatia; 400 (14.8%) from Slovakia; and 402 (14.9%) from Spain.

The data analysis was conducted with AMOS software in two stages, as proposed by Anderson and Gerbing (1988), to separately analyse the validity and reliability of the constructs and to test hypotheses based on the adopted research model using SEM. As a result, a confirmatory factor analysis was conducted first to test for the quality and adequacy of the measurement (Anderson and Gerbing, 1988) in an attempt to ensure the reliability, convergent validity and discriminant validity of the studied constructs; and secondly, to understand the causal relations among the latent variables.

4. Results

4.1 Measurement model

The overall goodness-of-fit indices of the measurement model are as follows: chi-square/degree of freedom (707,097/94) = 7.52, GFI = 0.968, AGFI = 0.954, CFI = 0.980, RMSEA = 0.049 and TLI = 0.974. The results of the mentioned indices show data correctness, indicating the model's fitness. All the statistics achieved the standards of fit for model. Next, all variables were tested for both convergent and discriminant validity. To examine convergent validity, both measures of composite reliability (CR) and the average variance extracted (AVE) values were used in the study. According to Fornell and Larcker (1981), AVEs value greater than 0.5 indicates that the convergent validity of the studied constructs is achieved. Similarly, the value of the CR for all variables must be above 0.60 (Sekaran and Bougie, 2013, p. 160). In Table 2, all values of the AVE and CR are presented and all are above the minimum level. Therefore, the latent variables of this study achieve good convergent validity. All factor loadings for the tested items were found to be significant at $p = 0.001$.

Discriminant validity was tested by comparison of the AVE with square multiple correlations (see Table 3). This approach showed that the constructs have a higher square root of AVE values compared to their correlations with other constructs. This indicates that there is discriminant validity for each individual construct (Fornell and Larcker, 1981). Hence, the constructs and measurement model items of the present study were deemed appropriate to test the developed propositions and structural models.

4.2 Structural model and testing of hypotheses

SEM analysis was used to estimate the path coefficients of the relations between the constructs in the research model. The following indices were calculated to evaluate the fit of the model: GFI = 0.923, AGFI = 0.894, CFI = 0.939, RMSEA = 0.084 and TLI = 0.926. All of these indices and the estimation of the model showed a good fit (Steenkamp and

Table 1.
Measurement scale constructs

Variable	Items	Source
Locus of control/self-efficacy (LC/SE)	LC/SE1. I believe that everyone has the ability to make a change through their own actions LC/SE2. Internal locus of control is crucial in pro-environmental behaviour LC/SE3. I think that people's self-control and self-efficacy awareness should be strengthened	Chiang *et al.* (2019), Giefer *et al.* (2019), Asghar and Nazneen (2016)
Ascription of responsibility (AOR)	AOR1. All consumers need to take responsibility for environmental problems AOR2. I think that every consumer is partly responsible for the environmental degradations caused by humankind	Shin *et al.* (2018)
Perceived environmental knowledge (PEK)	PEK1. I have more knowledge about recycling than the average person PEK2. I know where I can find products that create less waste. PEK3. I have knowledge about the sustainability symbols used on product packages PEK4. I am very knowledgeable about environmental and social issues	Joshi and Rahman (2017)
Awareness of consequences (AOC)	AOC1. I believe that limiting consumption can slow down the tempo of exhaustion of natural resources AOC2. Limiting consumption can possibly have a positive impact on the environment AOC3. I think that limiting consumption helps minimize environmental degradations	Shin *et al.* (2018)
Environmental concern (EC)	EC1. To survive, humans must live in harmony with nature EC2. I think environmental problems are very important EC3. I think environmental problems cannot be ignored EC4. I think we should care about environmental problems	Borusiak *et al.* (2021)

Baumgartner, 2000). The model explained 51% (R^2=0.51) of the variance for EC. Thus, the R^2 explains a substantial amount of variance.

The obtained results of the SEM reveal that the path coefficients from LC/to AOR and from PEK to AOC are all statistically significant ($\beta = 0.67, p < 0.001$ and $\beta = 0.44, p < 0.001$) and in the expected directions. The results also indicate that EC is determined by AOR and AOC. All these determinants turned out to be statistically significant ($\beta = 0.56, p < 0.001$; $\beta = 0.35, p < 0.001$) and in the expected directions. To sum up, the above results demonstrate that all the hypotheses in the research framework are supported (see Table 4).

The results of hypotheses testing are presented in Figure 2.

5. Discussion

In the current study, we confirm the positive impact of AOR and AOC on EC, which means that individual AOC and AOR for environmental issues both affect the EC of business students. We also show that LC/SE positively relates to AOR, while PEK positively influences AOC. In consequence, we gained support for all hypotheses (*H1–H4*).

Our results are consistent with previous studies. It was proven before that both AOC (Hansla *et al.*, 2008; Xie *et al.*, 2021) and AOR (Han, 2015; Xie *et al.*, 2021) are related to

Variable	Item	Loading	*p* value	CR	AVE
Locus of control (LC/SE)	LCSE1	0.762	***	0.84	0.65
	LCSE2	0.872	***		
	LCSE3	0.773	***		
Ascription of responsibility (AOR)	AOR1	0.832	***	0.81	0.67
	AOR2	0.814	***		
Perceived environmental knowledge (EK)	PEK1	0.791	***	0.88	0.66
	PEK2	0.821	***		
	PEK3	0.829	***		
	PEK4	0.818	***		
Awareness of consequences (AOC)	AOC1	0.87	***	0.92	0.79
	AOC2	0.91	***		
	AOC3	0.891	***		
Environmental concern (EC)	EC1	0.688	***	0.88	0.72
	EC2	0.902	***		
	EC3	0.906	***		
	EC4	0.889	***		

Note: ***$p < 0.001$
Source: Authors' own creation

Table 2.
Constructs and convergent validity

	LC/SE	AOR	PEK	AOC	EC
LC/SE	*0.803*				
AOR	0.621	*0.823*			
PEK	0.606	0.42	*0.814*		
AOC	0.589	0.712	0.396	*0.89*	
EC	0.66	0.699	0.388	0.644	*0.851*

Source: Authors' own creation

Table 3.
Discriminant validity

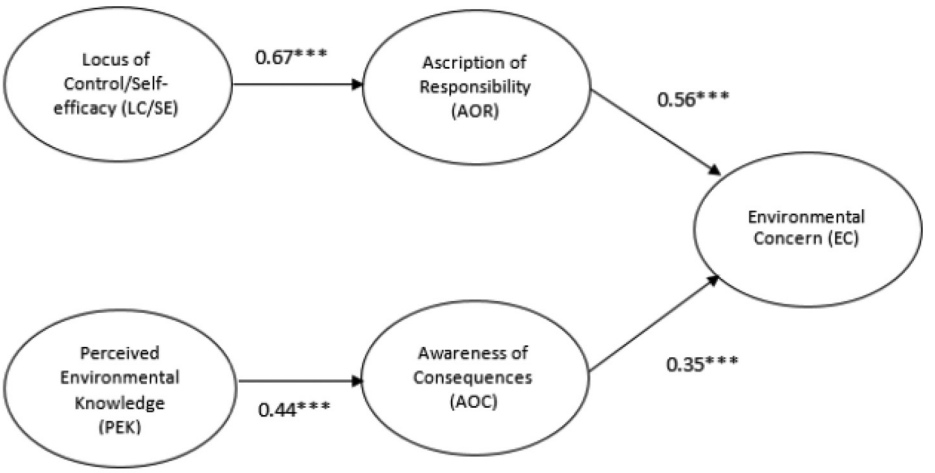
personal norms concerning pro-environmental behaviour and/or environmental concern. A study by Sarrasin *et al.* (2022), which incorporated perceptions of self-efficacy, feelings of external control and intergenerational obligation and was conducted among high school and bachelor students, revealed that perceptions of self-efficacy and intergenerational obligation predicted the probability of pro-environmental behaviours. Kuzniar *et al.* (2021) examined the impact of the level of knowledge and declared eco-friendly attitudes on specific purchasing decisions and showed that consumers' knowledge and environmental awareness influence consumers' attitudes and behaviour towards the need for ecological food products.

The novelty of our research lies in demonstrating an extended NAM, with two additional variables LC/SE and PEK, in which a significant influence on AOR and AOC was proved. Our model also demonstrates how the variables included in the study are related to each other. The Stern *et al.* (1999) model, based on the NAM Value–Belief–Norm, showed that AOR mediates the influence of AOC on pro-environmental personal norms. The strength of the mediator model was also proven in other studies (De Groot and Steg, 2009); however, it was typically in respect of pro-social, not pro-environmental personal norms. We tested the direct impact of both AOR and AOC on EC and showed that business students' EC variability is explained by both variables; though to a higher degree by AOR than by AOC. We also found that AOR is

Variable structural path	Beta	SE	CR	*p* value	Hypothesis test result
LC/SE → AOR	0.67	0.03	28.76	***	Supported
PEK → AOC	0.44	0.02	21.05	***	Supported
AOR → EC	0.56	0.02	24.07	***	Supported
AOC → EC	0.35	0.01	19.14	***	Supported

Note: ***$p < 0.001$

Table 4.
Results of SEM



Note: ***$p < 0.001$
Source: Authors' own creation

Figure 2.
Results of hypotheses testing

predicted to a very high degree by internal LC/SE, whereas AOC variability is explained by PEK to a lower degree. That drove us to the conclusion about the importance of people's belief concerning perceived command over the results of one's own actions. In the case of environmental issues, this is absolutely vital, as it is very hard to relate the actions of an individual with the state of the environment, so even people who are aware of the contribution their lifestyles make to climate change may feel that whatever they do, it will not produce any real benefit for the environment; they assess themselves as personally inefficacious with respect to protecting the environment (McKinnon, 2014). So what should be done to move people towards stronger environmental concern? Previous studies suggest that hope – defined as a mix of perceived self-efficacy – and pathways – understood as goals and the availability of means to reach them (Snyder *et al.*, 1991) – are necessary for young people to get involved in pro-environmental actions (Ojala, 2012). Our research confirmed that both internal LC/SE significantly determine EC with the mediation of AOR. LC/SE delivers motivation and works as the key agentic power of people's behaviour (Bandura, 2001). On the other hand, we also showed that PEK predicts EC with the mediation of AOC.

Bearing these results in mind, we can address the problem of the implementation of sustainability into business higher education to promote a more environmentally conscious way of thinking so as to foster pro-environmental behaviour.

Our results support the need to integrate education for sustainable development into teaching and learning practices at universities and to embed sustainability into higher education (Price *et al.*, 2021; Hill and Wang, 2018). HEIs play a prominent role in the social implementation of sustainability through their activities (Berchin *et al.*, 2021; Price *et al.*, 2021), which can significantly influence the pro-environmental attitude of students. The need to shape business students' attitudes is in line with the observations made by Lee and Hales (2022).

Educating students to develop a pro-environmental attitude, which would incline them to implement sustainable business practices, needs to be based on two legs: enhancing their self-efficacy and *locus* of control to supplement environmental knowledge, which is a necessary but not sufficient condition for the development and reinforcement of pro-environmental attitudes, as our study confirms. Based on the values of beta coefficients in SEM, the impact of LC/SE is twice as high as the impact of PEK. This difference could be discussed in the context of cognitive illusions and biases (Nicholls, 1999) and the overestimation of individual abilities (Kruger and Dunning, 1999), especially because the environmental domain is not the major one for business students. By focusing on their self-efficacy/*locus* of control, education for sustainable development can support students in developing a pro-environmental attitude. However, equipping them with environmental knowledge can help overcome cognitive biases and enhance their competencies.

Such results also raise the question of how internal *locus* of control and self-efficacy can be trained and taught. Personal attitudes and values can be incorporated into curricula at many levels, starting with the level of learning outcomes in business education programmes and courses. Learning outcomes consist not only of knowledge and skills but also of social competences, which are convenient areas into which to incorporate self-efficacy and *locus* of control as attitudes shaping students' ascription of environmental responsibility. Another possibility could be to integrate cultural contexts into the curriculum, e.g. the principles of sustainable development and systems of responsibilities (holistic approach, prevention and precaution, variety and diversity, subsidiarity, entropy, etc.).

The objective of any curriculum developed should support the formation of values and norms, to foster the implementation of sustainable business practices and courses of action related to sustainability that would become the basis for transforming our unsustainable

way of living. Developing attitudes and values through education can lead to a more efficient and effective transfer of knowledge and to the education of more professionals committed to sustainable development, contributing to building a sustainable society.

6. Theoretical and practical implications

This study has multiple implications, both theoretical and practical. From the theoretical perspective, the results contribute to the discussion on the NAM (Schwartz, 1977) and the possibilities of its application in pro-environmental behavioural motivations (Tang *et al.*, 2021; Foster *et al.*, 2022; van der Werff and Steg, 2015; Shin *et al.*, 2018; Fang *et al.*, 2019) as an example of pro-social behaviour. We found that the NAM can be adopted in an extended form to the investigation of business students' environmental concern predictors. In line with previous studies (Schwartz, 1977; De Groot and Steg, 2009), we confirm the significance of AOR and AOC as factors impacting the environmental concern of business students. However, we go further and confirm the higher explanatory power of AOR than AOC.

We contribute to the literature by assessing the predictors of ascription of responsibility (Stern *et al.*, 1999; Fang *et al.*, 2019) and awareness of consequences (De Groot and Steg, 2009; Hansla *et al.*, 2008). Previous research proved that pro-environmental attitudes can be explained directly by self-efficacy (Yoong *et al.*, 2018) which is a key concept of social cognitive theory (Bandura, 1991). Our findings indicate that both internal *locus* of control and self-efficacy as well as perceived environmental knowledge determine environmental concern indirectly: with, respectively, ascription of responsibility and awareness of consequences as mediators. This gives new insight and a deeper understanding of the process of building environmental awareness.

The study is of practical importance for shaping the education for sustainable development (ESD) in business higher education, as a crucial actor in implementing sustainability in societies (Etse and Ingley, 2016; Hill and Wang, 2018; Berchin *et al.*, 2021; Price *et al.*, 2021). The results show that values and attitudes related to the environment, along with perceived environmental knowledge, play a key role in shaping business students' environmental concerns. With evidence from our research, we provide useful information and insights for curriculum development, educational development and education policies implementing ESD into business higher education (Hill and Wang, 2018; Berchin *et al.*, 2021; Price *et al.*, 2021). This is primarily due to the fact that we point out correlations that were previously only suspected, rather than investigated in a demonstrable way.

Our results support the need for including competencies for sustainable development into curricula (Faham *et al.*, 2017; Price *et al.*, 2021; Chiang and Chen, 2022). We show that shaping business students' awareness of consequences (AOC) through their PEK is important but not sufficient for educating them towards environmental concern. The influence of PEK and AOC on students' *locus* of control/self-efficacy, and through this, impacting their ascription of responsibility, is of great importance in educating students towards sustainable development. Both the awareness of consequences and the ascription of responsibility positively influence environmental concern, but the effect of ascription of responsibility on EC is greater than the awareness of consequences.

Finally, our findings contribute to the discussion on the implementation of education for sustainable development as a part of general education or in independent courses with sustainability-related content (Etse and Ingley, 2016; Poon, 2017; Hill and Wang, 2018). The perceived environmental knowledge is significant in shaping the environmental concern of business students, but only together with the *locus* of control/self-efficacy and with the

ascription of responsibility and the awareness of consequences as mediators. It implies that education for sustainability cannot be based only on knowledge, but also on a wider spectrum of environmental competencies, which supports the inclusion of EDS into general education rather than only in dedicated courses.

7. Limitations

The research has also its limitations, related to availability and the nature of the data. The study was coordinated by the universities of six countries, and the survey cannot be called fully representative. Research was limited to European countries with relationships at the personal level of students, missing the macro level and perspective of other countries both inside and outside of Europe. The study focused on economic students, so technical sciences, natural sciences and other students also require further investigations. The age range of the respondents appears as a further limitation, in the case of graduate students, the workplace as a new environment provides further impulses, so the sensitisation, consciousness formation and attitude changes that have begun will continue to take shape in practice.

8. Conclusions

Implementing sustainability education at universities, essential in educating a new generation of sustainability-oriented business leaders, requires understanding factors that predict business students' environmental concern. This study has proven that both the ascription of responsibility, driven by the internal *locus* of control and self-efficacy and the awareness of consequences, driven by perceived environmental knowledge, are predictors of students' environmental concern.

As the study has shown, in education for sustainability, there is a need to provide environmental knowledge to business students and strengthen their internal *locus* of control and self-efficacy in an environmental context. This study contributes to the discussion on environmental concern in light of the sustainable-oriented attitude of students and on the implementation of education for sustainable development into higher education.

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Further reading

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