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Integrating sustainability into business and management studies in higher education

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ABSTRACT

This research investigates the crucial realm of sustainability education in university-level business and management studies. The main objective is to identify the main factors influencing sustainability learning and to establish a framework to guide universities in successfully integrating sustainability education into business and management degrees. Thus equipping students with the knowledge and skills based on sustainable business practices in their future professional careers. Through an exploratory factor analysis of 37 learning approaches for sustainability, this article determines six key actions that universities should undertake to effectively teach sustainability. These actions are Active on- and off-campus experiences, Promotion of students' leadership, Leisure and engagement, Institutional sustainability involvement, Academic programmes adaptation, and Professional knowledge and experience transfer. The proposed framework supports a basis for action for universities to ensure graduates are prepared to navigate the complex landscape of sustainability in their future working career.

1. Introduction

In recent decades, the imperative of sustainable development has gained widespread recognition as a pressing global concern, necessitating fundamental shifts in how societies operate and make decisions (Bolis, Morioka, & Szelwar, 2017; Silvestre & Țircă, 2019). People around the world have come to recognise that current business practices and methods are not sustainable. Transforming these practices requires proper instruction, heightened awareness, and education (Yadav & Prakash, 2022).

Within this context, educational institutions, especially universities and business schools, are deemed to a crucial role in addressing the challenges posed by unsustainable practices (Kohl et al., 2022; Ziegler & Porto-de-Oliveira, 2022). Business and management studies, as core disciplines shaping the future leaders of industries, bear a particular responsibility in equipping students with the knowledge, skills, and mindset needed to navigate complex sustainability issues (Terán-Yépez, Marín-Carrillo, Capobianco-Uriarte, & Casado-Belmonte, 2023). As the world grapples with issues such as climate change, social inequality, resource depletion, and ethical

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business practices, the integration of sustainability principles within business and management curricula has become not just an option, but an imperative (Annan-Diab & Molinari, 2017; Fang & O'Toole, 2023).

Higher Education Institutions (HEI) are striving to integrate principles of sustainability like ethics, ecological consciousness, poverty alleviation, and Corporate Social Responsibility (CSR) (Pizzutilo & Venezia, 2021). However, their success in this endeavour has not been fulfilled, leaving space for further enhancement. Three main drawbacks could be pointed out as to why so far, the extent to which sustainability has been applied in business and management education might have failed. The first issue revolves around the abundance of sustainability learning approaches, which makes it challenging to determine the primary actions that universities should take to teach sustainability in business and management programs. For instance, studies by Erskine and Johnson (2012) and Singhal, Gupta, and Mittal (2018) have identified as many as 37 different sustainability learning approaches. The second drawback is that while some studies have identified crucial factors for sustainability education in business and management, the methods and approaches used for teaching sustainability have been adopted without considering the valuable input of students, who are the primary recipients of this education. The third drawback stems from the combination of the first two issues, as the multiple sustainability learning approaches and the absence of student involvement in their development result in a lack of a framework for universities to effectively integrate sustainability into their curriculum. This paper seeks to address these research gaps by identifying the most vital factors for effective sustainability teaching in business and management university programs from the students' perspective and by proposing a comprehensive framework for the seamless integration of sustainability education into the curriculum.

By addressing these critical research gaps, this paper offers two main contributions to the field of sustainability education within business and management higher education. Firstly, it furnishes a practical foundation for navigating the intricate sustainability landscape, underscoring the pivotal role of integrating student perspectives into educational planning. Secondly, by embracing student opinions, the paper identifies six pivotal factors crucial for the success of sustainability education and offers a comprehensive framework for integrating sustainability into business and management higher education. Overall, this study seeks to guide educators, university administrators, and policymakers in shaping sustainability education in business and management degrees.

2. Literature review

2.1. Institutional framework on sustainability in higher education

Since the Principles for Responsible Management Education (PRME) in 2007 were defined under the coordination of the United Nations (UN) Global Compact (Parkes, Buono, & Howaidy, 2017), sustainability education in business and management higher education is oriented to acquire, assimilate, transform, and explore the Sustainable Development Goals (SDG) of the 2030 Agenda through responsible management education (Avelar, Farina, & da Silva Pereira, 2022). The UN SDGs, with a particular emphasis on Goal 4, underline the key role that universities are expected to play in advancing sustainability by integrating sustainability principles into their educational frameworks, fostering a comprehensive understanding of environmental management, social responsibility and ethical practices among students, researchers and the wider academic community (United Nations, 2015).

Within this framework, the essential role of local governments and inter-university coordinating institutions in promoting sustainability in university studies cannot be underestimated. Their commitment and leadership are essential in guiding educational policies towards the effective integration of sustainability in academic programmes (UNESCO, 2017).

In the Spanish context, the Conference of Rectors of Spanish Universities (CRUE) has been actively involved in fostering a commitment to sustainability among higher education institutions. CRUE Sectorial Sustainability Commission published in 2005 the document 'Guidelines for the Introduction of Sustainability in the Curriculum' which was updated in 2011 and expanded in 2012 (CRUE, 2012). The document outlined four competencies related to sustainability, highlighting the need for an in-depth revision of curricula. More recently, CRUE Sectorial Sustainability Commission published the 'Report on the implementation of Royal Decree 822/2021. On the inclusion of sustainability in university curricula' to provide Spanish universities with some guidelines and lines of action for the integration of the principles, democratic values and objectives of Sustainable Development (CRUE, 2023).

2.2. Relevance of sustainability training for business and management students

Sustainability education is fundamental to develop conscious business leaders capable of generating positive impacts on society and the environment while driving economic growth.

There are many aspects of business and management higher education that are directly linked to raise sustainability awareness of business leaders. Through CSR, businesses must take responsibility for the well-being of the communities in which they operate. Sustainability education helps future business leaders understand the impact of their decisions on people and the environment, promoting a more ethical and responsible future business culture (Ahmad, Islam, Sadiq, & Kaleem, 2021). Sustainability risk management helps businesses identify and manage risks associated with climate change (Scott, 2021), natural resource scarcity (Tashman, 2021) and other environmental and social issues. Business leaders must be prepared to meet these challenges and adapt their business strategies accordingly.

Sustainability can also drive innovation in companies (Awan, Sroufe, & Kraslawski, 2019). The search for more sustainable solutions can lead to the creation of more efficient and environmentally friendly products and services which, in turn, may increase companies' competitiveness (Padilla-Lozano & Collazzo, 2021). Adopting sustainable practices can enhance the company's reputation with consumers, investors, and other key stakeholders (Al Breiki & Nobanee, 2019). Customers are increasingly interested in doing business with socially and environmentally responsible companies (Awan, Arnold, & Gölgeci, 2021). In addition, sustainability is

generating more and more investment opportunities; investment funds and investors are paying more attention to the sustainable practices of companies when making investment decisions (Bernow, Godsall, Klempner, & Merten, 2019). Business leaders who understand and practice sustainability can more easily attract investment. Finally, governments and supranational institutions are increasingly implementing regulations and policies related to sustainability (Lamoureux, Movassaghi, & Kasiri, 2019). Business leaders need to be informed and prepared for regulatory compliance to avoid potential sanctions and damage to the company's reputation.

Thus, by integrating sustainability into business and management higher education, a more responsible, ethical and innovative business culture might be promoted which, in turn, might help address the current and future challenges of the business world with sustainability at the core.

Business and management higher education institutions are aware of the importance of the adoption of a holistic and dynamic approach to sustainability learning (Gupta & Singhal, 2017). Through the combination of specific content, active methodologies, an interdisciplinary approach and the use of technology, HEI seek to prepare a new generation of sustainability-conscious and committed professionals capable of driving positive change in business and society at large. Therefore, business and management higher education institutions are interested in discovering the pedagogical strategies that may enrich the learning process and allow students to apply their knowledge in real-world situations.

Notwithstanding research has shown that the awareness of sustainability training in business and management higher education institutions is arising, there is a lack of consensus of which is the most proper way to integrate sustainability in the curricula of business and management studies (Gupta & Singhal, 2017) and clear templates for its implementation (Slager, Pouryousefi, Moon, & Schoolman, 2020; Tridapalli & Elliott, 2023). Thus, there is still room for research in successful ways of integrating sustainability in education programs (Alcaraz & Thiruvattal, 2010; Yadav & Prakash, 2022).

2.3. Strategies for sustainability teaching-learning and relevance of student's perceptions in business and management education

There is a growing agreement on the set of key competencies in sustainability learning in higher education institutions, such as systems-thinking, futures-thinking, values-thinking, strategic-thinking, and interpersonal competencies (Brundiers et al., 2021; Redman, Wiek, & Barth, 2021; Wiek, Withycombe, & Redman, 2011). Similarly, researchers and teachers (see Frisk & Larson, 2011; Gupta & Singhal, 2017; Lozano, Merrill, Sammalisto, Ceulemans, & Lozano, 2017) have begun to converge on effective and efficient pedagogical approaches to develop these competencies, many of which are based on active learning methodologies providing meaningful, transformative, and, above all, motivating experiences (Martínez-Casanova, Rufz-Munzón, & Buil-Fabrega, 2022).

Business and management higher education institutions are implementing different learning activities and teaching methods to foster sustainability learning in the classroom (Singhal et al., 2018). One of the most common initiatives is the inclusion of specific subjects and content on business sustainability and corporate social responsibility in existing curricula or the incorporation of specialisation courses often jointly coordinated with other organisations and universities (Weybrecht, 2021). However, universities go beyond providing theoretical knowledge by adopting various learning activities that engage students in practical experiences and collaborative projects that allow them to apply their knowledge in the real world (Figueiró & Raufflet, 2015; Ortiz-Fernández & Tarifa-Fernández, 2022). The methodologies applied are very diverse and include: case studies, group discussion and debates, role play, flipped classrooms, problem-based and challenge-based learning (Gallagher & Savage, 2020; Martínez-Casanova et al., 2022; Wyness & Dalton, 2018), business simulators (Gawel, Strykowski, & Madias, 2022) and real-world experiential learning through guest speakers, field or site visits, consulting projects with sustainable businesses, internships in national and international organisations focused on sustainability, or participation in volunteer and community service programmes or service-learning (Rands, 2009; Rusinko, 2010; Weybercht, 2021). To enrich the teaching-learning process in sustainability, digital tools and technologies are being used (Bagur-Femenías, Buil-Fabrega, & Aznar, 2020). The development of massive open online courses (MOOCs), podcasts, online discussions, online games, and other interactive resources provide students with a more accessible, dynamic, and participatory learning experience (Clemens & Hamakawa, 2010; Gawel et al., 2022; Weybrecht, 2021).

Another strategy observed is the incorporation of initiatives aimed at supporting student research in sustainability. Through competitions, awards, and scholarships, undergraduate and PhD students have the opportunity to lecture and research on sustainability-related topics and contribute to knowledge and innovation in this area (Brundiers, Wiek, & Redman, 2010; Weybrecht, 2021). Even the incorporation of sustainability into the university's mission has been recognized as an effective education method for sustainability teaching (Terán-Yépez, Marín-Carrillo, Casado-Belmonte, & Capobianco-Uriarte, 2021).

Moreover, sustainable entrepreneurship programmes are being promoted. Through these programmes students can develop entrepreneurial projects that address sustainable issues and promote innovative solutions (Wagner, Schaltegger, Hansen, & Fichter, 2021; Weybrecht, 2021). There is also a proliferation of universities with student associations and clubs, such as Student Sustainability Councils, which help promote sustainability on campus and in the community. These clubs organise events, raise awareness, and promote sustainability projects. The management and coordination of these initiatives provide valuable leadership opportunities for student council members, improving their individual disposition towards sustainability, stimulating joint collaboration, and strengthening the capacity for critical analysis (Teslenko, 2019).

Therefore, research has focused on detecting effective sustainability learning and teaching approaches aimed to foster knowledge and skills and make learning engaging and relevant for business and management students (Emblen-Perry, 2019). However, there exists a demand for analysing the most effective learning approaches that may spur students on new ways of thinking and solving problems related to sustainability (Emblen-Perry, 2019; Howlett, Ferreira, & Blomfield, 2016). Learning and teaching approaches are designed to enable the development of sustainability competencies and give students the knowledge, skills and values that will be

required for the sustainable development process in their future careers and personal lives (Demssie, Wesselink, Biemans, & Mulder, 2019; Schank & Rieckmann, 2019).

The analysis of the strategies abovementioned provides insights into how higher education institutions in business and management have been addressing sustainability education. However, it is essential to emphasize that the implementation of educational methods and approaches must consider not only the perspectives of educators and administrators but also the opinions and expectations of students. In this vein, the involvement of students is deemed to be the key factor in influencing their sustainability behaviour (Leal-Filho, 2015).

Extant research has shown the benefits of analysing student perceptions. Specifically, Watson, Noyes, and Rodgers (2013) state that analysing students' perceptions of sustainability education may show and help to benchmark the current quality of a curriculum and to detect strategies for adapting a curriculum. In addition, Azapagic, Perdan, and Shallcross (2005), in an attempt to discover the knowledge of sustainability between engineering students, enhance the importance of knowing students' perceptions not only for the improvement of the curriculum, but also for the detection of new approaches to teach sustainability.

The methods and approaches for teaching sustainability have been adopted without considering the opinion of students, the main actor involved in receiving such education. Although some studies have offered the analysis of the importance or effectiveness of a particular learning technique, there exists a gap in literature to take a holistic framework towards the teaching and learning methods best perceived for the students to achieve the sustainability competencies. Thus, this research addresses the identification and definition of the main factors or actions that may foster sustainability education based on the perceived importance by business and management students, fulfilling the research gap by considering students' perceptions and proposing a comprehensive framework.

3. Research methodology

3.1. Research design, sampling process, and data collection

The survey for this study was conducted at the University of Almeria (located in the southern region of Spain). The University of Almeria was founded in 1993 and its commitment to sustainability is manifested in several ways. First, the university started in 2011 to publish the twice-yearly University Social Responsibility Report whose last version was published for the period 2019–2022 and is in line with the objectives and targets of the university strategic plan (University of Almeria, 2023b). This report integrates the university's social, labor, environmental, and human rights concerns into its governance and strategy in accordance with ethical principles. Second, the university launched in November 2016 the Environmental Sustainability Commission in order to elaborate annually the environmental sustainability action plans in line with the proposal of the Forum of Social Councils and together with the Andalusian universities (University of Almeria, 2017). The first annual action plan of the University of Almeria was published by this Environmental Sustainability Commission in 2017 (University of Almería, 2023a).

This study followed an exploratory research, since it was intended to gain insight from university students' perceptions into the main factors for effective sustainability teaching in business and management university degrees. In this regard, the current research gathered primary data by conducting a structured survey. The universe of the research was composed of business and management students. The sampling unit of this study encompassed the students of the Faculty of Economics and Business at the University of Almeria. The students were in the final two years of their bachelor's degrees. This choice was made because students at this stage have already completed a significant portion of their university studies. Therefore, they possessed a more comprehensive perspective on the sustainability-related education provided by the University. As such, the present study used a non-probability sampling technique namely purposive sampling. In order to ensure a comprehensive representation, participants were chosen from all five available bachelor's degree programs offered by the Faculty of Economics and Business: Accounting and Finance, Business Management and Administration, Economics, Marketing, and Tourism. The students were provided with a printed questionnaire to complete on their own. The survey was conducted between February and March of the previous academic year, which coincides with the beginning of the second semester. Following the removal of incomplete and unreliable surveys, the researchers ultimately had a sample size of 432 students, which was considered adequate for our research. Table 1 briefly presents the information outlining the research design and sampling process employed in the current study.

3.2. Survey design and measurement scale

The present research was carried out using a structured survey featuring questions with closed-ended questions. The survey was split into two sections. The first section mainly encompassed students' demographics including gender, age range, nationality, and bachelor's degree that students were currently studying. In the second section, a total of 37 learning approaches¹ on a seven-point Likert scale were established to identify main university actions for sustainability teaching in business and management studies. These 37 education methods for sustainable teaching in higher education derived from 125 publicly available PRME Sharing of Information on Progress (SIP) that were extracted from the studies of Erskine and Johnson (2012) and Singhal et al. (2018). The approaches are drawn from the self-reports of business schools giving account of their pedagogical experiences as members of business schools which support the PRME. Although the original measurement scale of these two studies was in English, for this study the

¹ See Appendix 1.

Table 1
Research design and sampling process.

Research design and sampling process	
Research Design	Exploratory research study
Method	Survey method
Universe of the study	Students of Economics and Business Sciences
Sampling Unit	Students of the Faculty of Economics and Business Administration of the University of Almeria
Sampling Design	Non-probability sampling
Sampling Technique	Purposive sampling
Sample Size	432

Spanish version of this instrument was used, which has been previously tested and validated by the study of [Terán-Yépez et al. \(2021\)](#).

3.3. Pretesting of survey-instrument and reliability of the questionnaire

Although the instrument has previously been validated in the literature, to assess the phrasing of the questions and the instrument's consistency, a preliminary test was administered to 18 students and five academics. Based on the results, a few slight modifications were identified as necessary. This preliminary testing allowed the researchers to address few survey-related errors and enhance the data quality considerably; aligning with recommendations from prior scholarly works ([Reynolds, Diamantopoulos, & Schlegelmilch, 1993](#)). Moreover, to evaluate the reliability of our survey tool, internal consistency reliability measure was employed by measuring Cronbach's alpha ([Hair, Black, Babin, & Anderson, 2014](#)). The range of Cronbach's alpha values was between 0 and 1, where values exceeding 0.7 were considered favourable; that is, indicating strong internal consistency reliability of the items in the questionnaire scale. In our investigation, Cronbach's alpha value for the 37 scale items was 0.961, signifying robust internal consistency reliability for our questionnaire.

4. Data analysis and findings

4.1. Profile of respondents

This study was based on a sample of 432 students of the Economics and Business Faculty of the University of Almeria. The majority of the respondents were Spanish (87.3%) and the rest of the interviewees (12.7%) were from other countries such as China, Rumania and Morocco, among others. In terms of gender, the sample was composed of 58.8% of women and 41.2% of men. Regarding the age of the respondents, splitting into three ranges of ages to facilitate the comparison among the respondents' ages (cf. [Hawkins & Shaw, 1992](#)) we defined: early students between 18 and 20 years old (20.7 %), traditional students between 21 and 22 (51.0 %), and older students of 23 years old or more (28.3 %).

4.2. Exploratory factor analysis

The methodology used for this study is Exploratory Factor Analysis (EFA) based on the principal component analysis. The entire statistical analysis was developed using SPSS software (v. 29).

4.2.1. Factor analysis design

The data gathered represent metric variables and, thus, exploratory factor analysis was applicable to the analysis for this study ([Hair et al., 2014](#)). In terms of sample appropriateness for factor analysis, we gathered 432 observations for each of the items and, as this quantity was much bigger than 10 observations per item, factor analysis could be carried out ([Yadav & Prakash, 2022](#)) for determining factors in our sample.

4.2.2. Assumptions in factor analysis

With the aim of using factor analysis, we firstly checked specific assumptions that were needed to be met before applying this methodology. In terms of theoretical support, the items of the exploratory factor analysis were listed by the Principles of the Responsible Management Education (PRME) developed by the United Nations.

Besides, we analysed the needed statistical requirements. First, some degree of multicollinearity was desirable for an effective application of the EFA. The level of the multicollinearity was analysed based on the tolerance values and the Variance Inflation Factor (VIF). Both were found to stand within acceptable ranges, resulting the tolerance values higher than 0.2 and the VIFs lower than 3.3, indicating, although low, some extent of collinearity among items ([Diamantopoulos & Sigauw, 2006](#); [Okazaki, 2006](#); [Thompson, Kim, Aloe, & Becker, 2017](#)). Second, we run the Kaiser-Meyer-Olkin (KMO) test to check the sample adequacy ([Hair et al., 2014](#)) and the Bartlett test of sphericity to determine the presence of a significant correlation among variables ([Hair et al., 2014](#)). Both of them resulting in sample adequacy of the total sample. [Table 2](#) summarizes the assumptions needed to be met for running the factor analysis.

With the aim of easing the interpretation of the extracted factors, their items and analysing the items loadings for each factor, we executed the Varimax rotation method for the factor analysis. We removed several items because they presented factor loadings below the threshold of 0.4 ([Hinkin, 1995, 1998](#)) resulting our final scale composed of 29 items. Besides, we calculated the anti-image

Table 2
Assumptions required in factor analysis.

Assumptions required in factor analysis		
EFA requirements	Source	Result
Theoretical support:	Literature review on PRME	Supported
Statistical support:		
Multicollinearity	Tolerance values and VIFs	Supported
Sample adequacy	KMO test and Bartlett test	Supported

correlation matrix to analyse if the elements of its diagonal were near to 1 and the rest of the matrix elements were small, confirming sample adequacy of the sample resulting from the retained items. For the final sample, the approximate chi-square statistic for the Bartlett test was 6564.734 with 406 degrees of freedom which was significant ($p < .001$) and the KMO resulted in 0.947 which was an adequate value (Hair et al., 2014). Both tests indicating sample adequacy. Table 3 resumes the results which confirm that the final sample held the statistical requirements for running the EFA.

4.2.3. Factor analysis

Once the assumptions were confirmed and the statistical requirements met, we run the EFA for which we analysed the scree plot and apply the eigen-value criterion in order to determine the number of factors that would remain after the EFA. Examining the scree plot (Fig. 1) visually, the factors selected were those which come before the steep slope of factors with large eigenvalues and gradual trailing starts was denoted (Malhotra & Dash, 2010). Besides, we analysed the results obtained for the eigen-values retaining those factors presenting eigen-values larger than 1 and coinciding with the conclusions obtained analysing the scree plot. Based on those criteria, the EFA resulted in 6 factors that explained 65.84 % of the variance and had, at least, two items each.

Table 4 shows the details of retained factor loadings, eigenvalues, and percentage of variance explained. Based on the EFA results and on the minimum factor loadings for items, six factors remained with, at least, two items per factor. Once we determined which items made up each factor and based on the literature review that we had conducted, we assigned names to each factor based on the information it contained.

4.3. Reliability and validity

4.3.1. Reliability

In order to assess the scale's internal consistency reliability, the Cronbach's alpha test was run since it is a widely accepted and commonly used method (Hair et al., 2014). The alpha value for all 29 items was 0.950, which is greater than the acceptable lower limit of Cronbach's alpha of 0.70 (Hair et al., 2014) and the limit of 0.60 accepted in social sciences (Hair et al., 2014). These findings indicated good internal consistency reliability. Table 5 shows the internal consistency reliability of the extracted six factors, whose values also indicate good levels of internal consistency between the items in each factor.

4.3.2. Validity

4.3.2.1. Content validity. The content validity was assessed based on the theoretically supported relationship on extant literature, concluding that all the scale items satisfactorily represent and measure the content that is initially intended to measure.

4.3.2.2. Convergent validity. We assessed the convergent validity following the astringent method that measures the significant factor loadings between two constructs based on the results of the rotated component matrix. With that aim, we performed factor analysis between all the items included in two factors comparing them two by two. We started with an exploratory factor analysis of the items included in Factor 1 and in Factor 2. The results of the rotated component matrix of this EFA confirmed the items of Factor 1 having significant loadings in the first factor and the items of Factor 2 having significant loadings in the second factor. The average factor loading was greater than 0.5 which supports convergent validity. We analysed the same relationships among Factor 2 and Factor 3, Factor 3 and Factor 4, Factor 4 and Factor 5, Factor 5 and Factor 6, and Factor 6 and Factor 1. The findings in each of the comparisons supported convergent validity.

Table 3
KMO measure and Bartlett's test of sphericity.

KMO measure of sampling adequacy		0.947
Bartlett's test of sphericity	Approx. Chi-Square	6564.734
	Degrees of freedom	406
	Significance	0.000

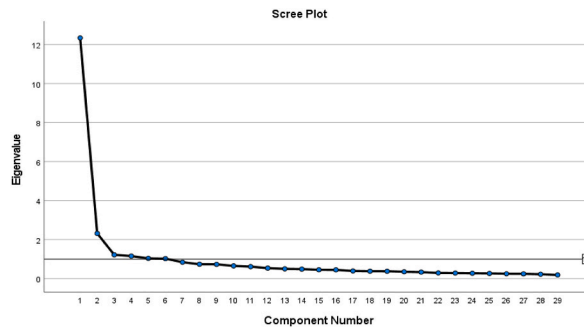


Fig. 1. Scree plot.

Table 4

Details of extracted factor loadings, Eigenvalues, and variance explained.

Details of extracted factor loadings, Eigenvalues, and variance explained			
Components	Factor loadings	Eigen values	% of variance explained
Factor 1: Active on- and off-campus experiences.	.770	12.340	42.552
IM3. Promoting internships related to sustainable business practices.	.769		
IM5. Implementation of sustainability practices at the university level.	.723		
IM6. International opportunities to learn about sustainability.	.719		
IM4. Use of sustainability-related business simulations.	.687		
IM2. Sustainability integrated into various subjects.	.663		
IM1. Providing sustainability-related scholarships.	.550		
IM7. A field trip away from campus to learn about sustainability.			
Factor 2: Promotion of students' leadership.		2.317	7.990
IM21. Promote the creation of student organisations targeting sustainability projects.	.752		
IM20. A career fair about sustainability jobs.	.642		
IM24. Conducting student competitions in the classes based on sustainability issues.	.641		
IM25. Forming a student club focused on sustainability.	.639		
IM23. Conducting calls for sustainability study projects.	.597		
IM22. Conducting workshops on sustainability issues with teachers and business people.	.589		
IM26. Certification for students involved in innovative sustainability activities.	.522		
Factor 3: Leisure and engagement.	.777	1.220	4.206
IM30. Holding a film series focused on sustainability issues.	.684		
IM33. Social night's on-campus and off-campus for student groups to discuss sustainability issues.	.633		
IM31. Student panel discussion pertaining to sustainability.	.581		
IM32. Student network projects related to sustainability.	.485		
IM28. Compulsory sustainability course for students.			
Factor 4: Institutional sustainability involvement.	.794	1.157	3.990
IM37. Participation in sustainability rankings/ratings such as Princeton rankings.	.665		
IM36. Membership of international sustainability forums (such as PRME-Principles for Responsible Management Education).	.597		
IM27. Sustainability incorporated into the university's mission.	.592		
IM35. A pledge taken by students to observe sustainability practices.			
Factor 5: Academic programmes adaptation.	.754	1.037	3.577
IM17. Starting a degree program in sustainability within the university.	.653		
IM16. Floating elective subjects in sustainability for students.	.525		
IM18. Promoting research-level studies about sustainability among students.	.475		
IM19. Mentoring program to help students learn about sustainability.			
Factor 6: Professional knowledge and experience transfer.	.777	1.023	3.529
IM11. Invited lectures by experts in sustainability (Master Class)	.743		
IM10. Guest speakers in classes to discuss sustainability.			

4.4. Descriptive statistics of the extracted factors

Table 6 shows the values of the mean and standard deviation of the factors extracted after carrying out the EFA.

5. Discussion and framework development

The aim of this research is to determine the factors that are relevant for the integration of sustainability in higher education in

Table 5
Reliability analysis.

Reliability analysis			
Factor No.	Factor name	Number of items	Cronbach's alpha
1	Active on- and off-campus experiences	7	.869
2	Promotion of students' leadership	7	.890
3	Leisure and engagement	5	.850
4	Institutional sustainability involvement	4	.820
5	Academic programs adaptation	4	.795
6	Professional knowledge and experience transfer	2	.792

Table 6
Descriptive statistics of the extracted factors.

Descriptive statistics of the extracted factors					
Factor No.	Factor name	N	No. of items	Mean	Standard deviation
1	Active on- and off-campus experiences	423	7	38.95	6.657
2	Promotion of students' leadership	417	7	35.03	7.879
3	Leisure and engagement	422	5	22.14	6.541
4	Institutional sustainability involvement	424	4	20.65	4.441
5	Academic programs adaptation	425	4	19.95	4.644
6	Professional knowledge and experience transfer	423	2	10.88	2.382

business and management. The study confirms the importance of considering the PRME with the business and management higher education programs.

Even though current students will be the managers and leaders of organisations in the near future, the literature of the importance they perceive of sustainability related teaching methods is still scant. In this context, this paper sheds light on the necessity of nurturing the knowledge regarding the relationship between sustainability education and business and management education.

Considering the results of the Exploratory Factor Analysis developed, there are six key factors that have a significant impact on the perceived importance of sustainability in their academic programmes. The factors are *Active on- and off-campus experiences*, *Promotion of students' leadership*, *Leisure and engagement*, *Institutional sustainability involvement*, *Academic programs adaptation*, and *Professional knowledge and experience transfer*. We explain and discuss below the findings associated with each of the six factors.

5.1. Active on-and off-campus experiences

Experimenting and experiences are key for learning in higher education. Indeed, students' participation in meaningful educational activities has been pointed out as a core element for learning (Carini, Kuh, & Klein, 2006). Specifically, higher education activities developed to promote sustainability might prepare students for future challenges (Boud & Falchikov, 2006). The factor 'Active on- and off-campus experiences' considers the relevance of promoting sustainability-related knowledge and activities, such as adding sustainability as subjects' chapters, carrying out internships, analyse business simulations, or going on field trips, among others (Gawel et al., 2022; Weybrecht, 2021).

5.2. Promotion of students' leadership

In terms of giving a leading role to students, leadership might help students to deal with problems with greater complexity (Perkins, 2008) and to achieve unexpected accomplishments related to the ability to engage others (Ganz & Lin, 2011). In relation to sustainability, giving a leadership role to students might be highly influential to students' learning of sustainability (Burns, 2016; Teslenko, 2019). The factor 'Promotion of students' leadership' is related to assigning leadership roles to students. In this line, the construct also includes specific information on the perceived relevance in terms of the offer of student organisations, career fairs, or calls for sustainability study projects (Figueiró & Raufflet, 2015; Wagner et al., 2021).

5.3. Leisure and engagement

First, research has not only emphasised leisure as a value source of learning (e.g., Roberson Jr, 2005; Roggenbuck, Loomis, & Dagostino, 1990) but also as a great promoter with more specific purposes such as for teaching sustainability to higher education students (Bell, Gibson, Tarrant, Perry, & Stoner, 2016). Second, learning results depend on student involvement (Carini et al., 2006). Indeed, some authors suggest that engagement might be one of the most important factors for learning (Poondaj & Lerdpornkulrat, 2016). Concerning of sustainability learning, student involvement and engagement are crucial to materialise efforts in the direction of sustainability improvements (Butt, More, & Avery, 2014). The factor 'Leisure and engagement' contemplates the inclusion of recreational activities and the search for the engagement of students based on information related to a sustainability-related series, social nights, or panel discussions among others.

5.4. Institutional sustainability involvement

Institutions are making efforts towards sustainable development and higher education institutions follow this trend as well (Amaral, Martins, & Gouveia, 2015). To materialise these efforts, institutions and universities are integrating sustainability principles into their everyday activities and structure (Lukman & Glavič, 2007). The factor ‘Institutional sustainability involvement’ contains information about participation in rankings or ratings, membership of international sustainability forums, or the university’s mission (Terán-Yépez et al., 2021).

5.5. Academic programmes adaptation

To integrate sustainability into higher education, values and awareness about sustainability must be embedded into curriculums (Lukman & Glavič, 2007). The incorporation of sustainability-related key competences in academic programmes might trigger effective sustainability teaching (Weybrecht, 2021; Wiek et al., 2011). The factor ‘Academic programmes adaptation’ considers issues related to the adaptation of the curriculum/degrees/academic planning to integrate sustainability. Specifically, it considers starting a degree programme in sustainability within the university, offering sustainability-related elective subjects for students or promoting research-level studies about sustainability among students.

5.6. Professional knowledge and experience transfer

Transferring professional knowledge and experience to higher education students might give them an overview of real-life issues and their potential solutions. In terms of sustainability issues, lecturers or guest speakers can be key to transferring examples or good practices to the students due to their knowledge and professional experience (Cotton, Warren, Maiboroda, & Bailey, 2007). The factor ‘Professional knowledge and experience’ refers to the transfer of professional knowledge and experience through invited lectures by experts in sustainability and guest speakers in classes to discuss sustainability (Rands, 2009).

Fig. 2 summarizes the proposed framework in this study for integrating sustainability education into business and management degrees.

6. Conclusion

6.1. Conclusion

This study addresses three critical drawbacks in the current landscape of sustainability education in business and management programs. These include the abundance of sustainability learning approaches, the lack of student involvement in their development, and the absence of a cohesive framework for curriculum integration. This research fills these gaps by identifying the most vital factors

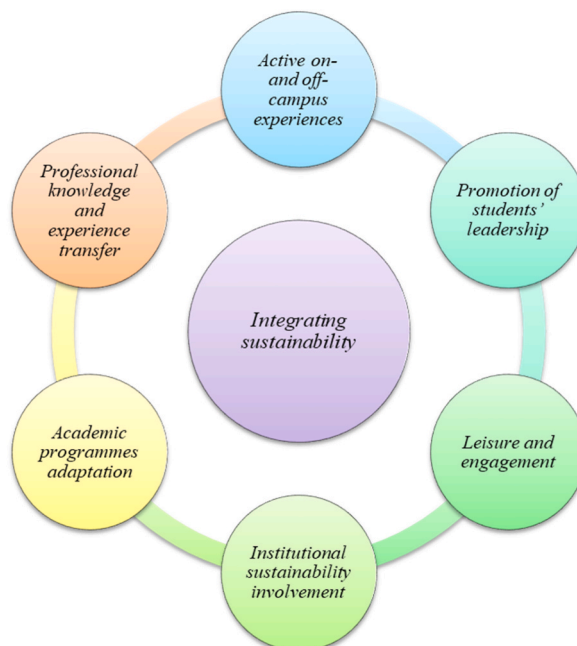


Fig. 2. Framework for integrating sustainability education into business and management degrees.

for effective sustainability teaching from the students' perspective and proposing a comprehensive framework for the seamless integration of sustainability education into the curriculum.

Based on the review of previous literature on the subject and empirical survey data in Spanish context, six key factors were identified as having significant impact from students' opinion of sustainability teaching and learning approaches in their academic programmes. Namely, these factors are *Active on- and off-campus experiences*, *Promotion of students' leadership*, *Leisure and engagement*, *Institutional sustainability involvement*, *Academic programmes adaptation*, and *Professional knowledge and experience transfer*. These six factors have allowed us to propose a framework for better integrating sustainability into business and management higher education.

This study emphasises that the effective achievement of the integration of sustainability in the education of future business and management leaders, depends on paying attention to the six prevalent factors. In this regard, higher management education institutions may adopt teaching and learning techniques that cultivate students' commitment to sustainability.

6.2. Limitations

This is a regional study. The findings derived from a single university may not be directly extrapolated to other academic institutions, given the distinct characteristics and dynamics that each university possesses when formulating policies and instructional methods related to sustainability. Moreover, students' perceptions regarding the significance of the analysed learning approaches could be subject to the influence of varying social, cultural, and economic factors across different regions.

6.3. Implications and future research avenues

This paper makes two significant contributions to the field of sustainability education within business and management higher education. Firstly, it offers a practical foundation for navigating the complex sustainability landscape, emphasizing the crucial role of incorporating student perspectives into educational planning. Secondly, by embracing student opinions, it identifies six pivotal factors essential for the success of sustainability education and provides a comprehensive framework for integrating sustainability into business and management higher education. Ultimately, this study emphasises the importance of incorporating into future educational planning those factors that, although identified and defined as most relevant from the student's perspective, have not yet been considered in the educational strategic plan for the sustainability. This study aims to guide educators, university administrators, and policymakers in shaping sustainability education in business and management degree programs, fostering a more sustainable and responsible future for the business world.

As a future line of research, exploring the inclusion of multiple universities in the study would yield valuable insights, allowing the examination of contextual and cultural variations within the analysis. In addition, the incorporation of qualitative research methods could provide a more nuanced and contextual perspective, enriching the understanding of the findings derived from the factor analysis.

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CRedit authorship contribution statement

María del Mar Martínez-Bravo: Conceptualization, Formal analysis, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **María de las Mercedes Capobianco-Uriarte:** Data curation, Formal analysis, Supervision, Writing – original draft, Writing – review & editing. **Eduardo Terán-Yépez:** Conceptualization, Data curation, Methodology, Resources, Validation, Writing – original draft, Writing – review & editing. **Gema María Marín-Carrillo:** Conceptualization, Data curation, Formal analysis, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing. **María del Pilar Casado-Belmonte:** Conceptualization, Data curation, Formal analysis, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors have no relevant financial or non-financial interests to disclose.

Data availability

Data will be made available on request.

Appendixes

Appendix 1

Approaches based on the Principles for Responsible Management Education

Nb.	Description
IM1	Providing sustainability-related scholarships
IM2	Sustainability integrated into various subjects
IM3	Promoting internships related to sustainable business practices
IM4	Use of sustainability-related business simulations
IM5	Implementation of sustainability practices at the university level
IM6	International opportunities to learn about sustainability
IM7	A field trip away from campus to learn about sustainability
IM8	Additional points for students involved in sustainability projects
IM9	Conducting case studies in classes based on sustainability
IM10	Guest speakers in classes to discuss sustainability
IM11	Invited lectures by experts in sustainability (Master Class)
IM12	Enhanced environmentally friendly (green) initiatives on campus
IM13	Establishing a sustainable business centre at the university
IM14	Incorporating sustainability learning goals within existing courses
IM15	Promoting student team projects related to sustainability
IM16	Floating elective subjects in sustainability for students
IM17	Starting a degree programme in sustainability within the university
IM18	Promoting research-level studies about on sustainability among students
IM19	Mentoring programme to help students learn about sustainability
IM20	A career fair about sustainability jobs
IM21	Promote the creation of student organisations targeting sustainability projects
IM22	Conducting workshops on sustainability issues with teachers and business people
IM23	Conducting call for sustainability study projects
IM24	Conducting student competitions in the classes based on sustainability issues
IM25	Forming a student club focused on sustainability
IM26	Certification for students involved in innovative sustainability activities
IM27	Sustainability incorporated into the university's mission
IM28	Compulsory sustainability course for students
IM29	Organization of conferences focused on sustainability issues
IM30	Holding a film series focused on sustainability issues
IM31	Student panel discussion pertaining to sustainability
IM32	Student network projects related to sustainability
IM33	Social nights on-campus/off-campus for students groups to discuss sustainability issues
IM34	Online webinars related to sustainability
IM35	A pledge taken by students to observe sustainability practices
IM36	Membership of international sustainability forums (such as PRME-Principles for Responsible Management Education)
IM37	Participation in sustainability rankings/ratings such as Princeton rankings

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