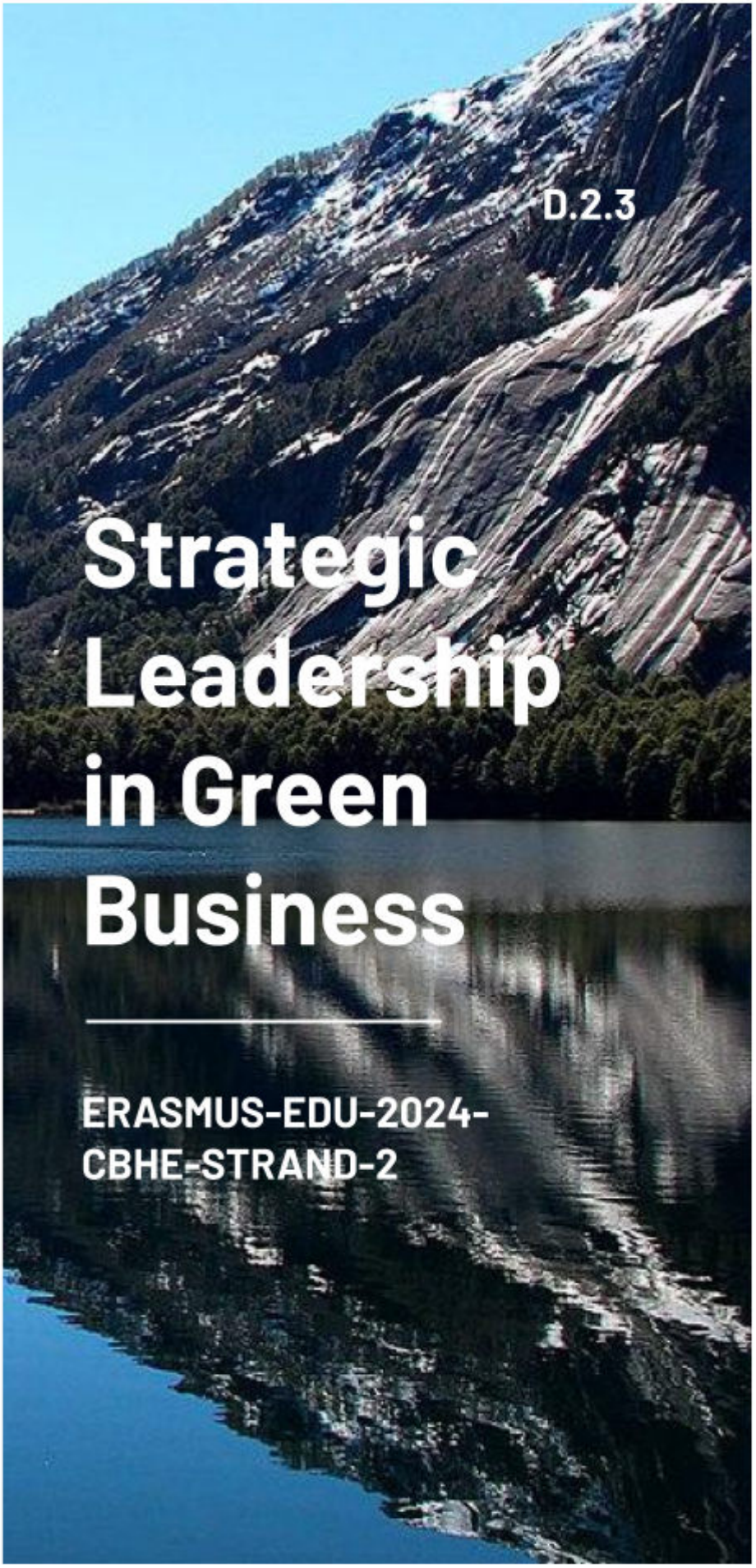

Compiled Report on the Needs Analysis for Ecuador

P. Code: **101179307**

Co-funded by the European Union

Table of context

Project Information

Strategic Leadership in Green Business (SLGB) was specifically designed to address regional needs, leveraging the opportunity to create a significant and sustainable impact in the region. The project involves collaboration and participation from multiple Latin American countries (Ecuador, Colombia, and Argentina) alongside three European countries (Spain, Sweden, and Finland) to develop a Strategic Leadership for Green Business program. The participating Latin American countries share similarities in terms of socio-economic and cultural contexts. The SLGB project aims to enhance specific knowledge and, consequently, the capacity of Latin American students to become effective leaders and entrepreneurs, tackling the challenging issues of sustainable prosperity in Latin America and the transition of productive sectors toward decarbonization, as part of the European Green Deal.

Project Code	101179307
Project Acronym	SLGB
Full Project Title	Strategic Leadership in Green Business
Call Identifier	ERASMUS-EDU-2024-CBHE
Topic	ERASMUS-EDU-2024-CBHE-STRAND-2
Type of Action	ERASMUS-LS
Duration (in months)	24
Start Date	November 1, 2024
End Date	October 31, 2026

Deliverable Details

Title	Compiled Report on the Needs Analysis for Colombia
Number	2.3

Location	https://greenleaderslatam.com/deliverables/
WP	WP2
Task	T.2.1, T.2.2, T.2.3
WP Leader	University of Vaasa, Finland
Deliverable Leader	N/A public deliverable
Version	V.3
Status	Completed
Deliverable Type	R – Document
Dissemination Level	PU – Public
Due Date	31.5.2025
Date of submission to EC	30.5.2025
Actual date of delivery	17.7.2025
Authors	N/A public deliverable.
Contributors	N/A public deliverable.
Reviewers	N/A public deliverable.
Spanish version	https://greenleaderslatam.com/deliverables/

Version History

Version	Date	Author	Partners	Description
V.1	27.05.2025	UVA	UB, UPEC	First version of the report

V.1.1	28.05.2025	UVA	UB, UPEC, WA	Revision
V.2	30.05.2025	UVA	UB, UPEC, WA	Final version
V.3	15.07.2025	UVA	UB, UPEC, WA	Final version with corrections, and link for Spanish versions added

Deliverable Summary

This report is a compiled comprehensive report on the needs analysis for Ecuador involving Universidad Estatal de Bolívar (UEB) and Universidad Politécnica Estatal del Carchi (UPEC). This report offers detailed insights gathered from students, professors, and industry experts regarding their needs for the SLGB program. It highlights the significant themes of competencies, skills, knowledge gaps, and expectations from data obtained from three groups. Based on these identified themes, this report offers recommendations for curriculum development, teaching methods, support mechanisms, and industry collaboration to ensure the success of the SLGB program.

Keywords

Need analysis; compiled report; UEB; UPEC; Students; Professors; Industry experts

Disclaimer and Legal Notice

"Co-Funded by the European Union. The opinions and views expressed in this document are, however, those of the authors and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency

(EACEA). Neither the European Union nor the granting authority can be held responsible for them."

List of acronyms

UEB	Universidad Estatal de Bolívar
UPEC	Universidad Politécnica Estatal del Carchi
SDGs	Sustainable development goals

Introduction

This section provides the key findings of the survey conducted with students, professors, and industry experts in Ecuador. Two universities have been involved in conducting these surveys namely Universidad Estatal de Bolívar (UEB) and Universidad Politécnica Estatal del Carchi (UPEC). The scope of this analysis encompasses three main target groups: students, professors, and industry experts from Ecuador. Each group offers exclusive insights into the requirements and expectations for the SLGB program. The analysis includes several themes, including competencies and skills needed, current knowledge and skills, improvement areas, course content and methodology, challenges and needed support, complementary activities, and specialization preferences. By examining these themes across all three groups, this report focuses on identifying commonalities and differences between different themes across three target groups that will inform the development of a comprehensive and effective SLGB program.

To obtain these insights, a comprehensive methodological approach was adopted. Rather than relying solely on traditional focus groups, the research team chose to conduct an in-depth survey process complemented by meetings and collaborative sessions with professors and industry professionals. This decision was based on the need to collect a broader and more structured set of data, allowing for quantitative and qualitative analysis across a larger and more diverse sample.

The approach included team-based work sessions and direct interactions with participants, which allowed for a deeper understanding of individual and collective perspectives. This format enabled a richer collection of data than typical focus groups would have provided, ensuring that the findings were well-grounded and representative of the target populations. By analysing these themes across the three groups, this report aims to highlight both the commonalities and differences that will inform the design and development of the SLGB training programme.

Methodology

For the methodology, this report covers the structured questionnaires that were prepared for the target groups, i.e. students, professors, and industry experts. These questionnaires were developed to obtain detailed insights into several factors related to the SLGB program. The target groups for this analysis are as follows:

Students

The student questionnaire includes questions on demographic information, current knowledge and skills, improvement areas, competencies and skills needed to succeed in the SLGB, expectations from the course regarding content and structure, course format and methods, challenges and needed support, complementary activities, and specialization preferences. The student survey was conducted with a sample size of 227 respondents from UPEC and 365 respondents from UEB.

Professors

The professor questionnaire includes questions on competencies and skills needed from students to succeed in the SLGB program, students' current knowledge and skills, improvement areas, integration and design of the course, and needed support to succeed in the program. The professor survey was conducted with a sample size of 20

respondents from UPEC and 86 respondents from UEB.

Industry Experts

The industry expert questionnaire includes questions on industry challenges related to sustainable and green business, important values for business, competencies, and skills needed from students to succeed in the SLGB program, skill gaps and improvement areas required from students, course content and methods from an industry perspective.

The industry expert survey was conducted with a sample size of 12 respondents (Tulcán, Ecuador) and 30 respondents (Guaranda, Ecuador) from various industries operating in sectors such as commerce, energy, education, agribusiness, technology, health, and consulting

The data collected from these questionnaires were analyzed to identify common themes and specific needs across all three groups. This analysis forms the basis for the recommendations provided in this report.

Demographic Background of Participants

Demographic Backgrounds - Students

UEB – The sample consists of 365 respondents. The majority of respondents identify as women representing 67.4% of the responses while 31.8% identified as men. There is a minority who choose not to specify their gender or identify as non-binary, reflecting diversity in identities. This suggests the relevance of considering inclusive approaches and diversity in future studies or related policies. The vast majority of respondents (74.7%) are between 18 and 24 years old. The second-largest group (20.8%) is between 25 and 34 years old. The other age groups have a much smaller representation.

The majority of respondents have an undergraduate level and correspond to women, followed by a significantly smaller proportion of men. This marked difference reflects a possible gender disparity in access to or participation in education in the context studied. The concentration at the same educational level suggests academic homogeneity, which could guide specific strategies according to profiles. In addition, it invites exploring social or methodological factors that influence this distribution of a homogeneous demographic profile.

The two main areas of training/experience are "Social Sciences and Humanities" (36.7%) and "Sciences (Biology, Chemistry, Physics, etc.)" (19%). "Economics, Finance, and Business" represents 11.9% and "Engineering and Technology" 11.4%. Other areas have a smaller representation. The predominant areas of training/experience are concentrated in Social Sciences and Humanities, followed by Pure Sciences, while Economics, Business, and Engineering have moderate participation. The distribution reflects a diverse academic profile, but with clear thematic priorities, possibly linked to professional interests or institutional approaches. The lower representation of other disciplines suggests opportunities to broaden perspectives in future studies. This segmentation could influence methodological approaches or interpretations according to the formative biases of the sample.

Almost all respondents (82.3%) have no work experience in green businesses or sustainability, indicating that they are students or are just starting. 9.8% have less than 1 year of experience. The other levels of experience are in the minority. There is a lack of work experience in green businesses or sustainability, which suggests a predominantly academic profile or one in the initial stage of professional insertion. The low proportion with experience, even minimal, reflects an emerging job market or one with access barriers. This could indicate an opportunity to strengthen practical training and policies that encourage participation in the sector. It also highlights the need to address gaps between theoretical training and applicability in this sustainable field.

UPEC – The sample consists of 227 respondents. 65% are women and 35% are men, reflecting a trend of greater female participation in sustainability and green leadership issues. 82% of the respondents are between 18 and 24 years old, confirming a predominantly young and university student profile. Regarding education, 58% come from Engineering and Technology, followed by 21% in Sciences, which suggests that the interest in green businesses is strongly linked to technical and scientific disciplines. 71% have no work experience in sustainability, indicating that most are looking for their first professional approach to the sector. This context allows us to guide the training and support strategies of the program. Female participation is significantly higher. This may be due to greater environmental and social awareness among women, as well as a growing trend of female leadership in sustainability issues. The data suggests that future communication and recruitment strategies could focus on maintaining and enhancing this participation, without neglecting the inclusion of men.

The overwhelming majority of participants are young university students. This implies that the program must be designed with methodologies and content attractive to this age group, prioritizing innovation, the use of technology, and flexibility in learning. In addition, the low percentage of people over 34 years of age shows an opportunity to attract more experienced professionals in future editions. It is important to note that both "Secondary" and "High School" correspond to the minimum education requirement necessary to enter the university (UPEC), so we group them as the same educational level in this context. In addition, all those who are currently in the sixth semester or who still remain in the university ("Sixth/Sixth-semester" category) have already completed, at least, high school or secondary, as it is an access requirement for higher education.

The predominance of technical and scientific areas reveals that those interested in green businesses at UPEC tend to have training oriented towards problem-solving, innovation, and the application of practical knowledge. This can enrich the development of sustainable projects but also points out the opportunity to strengthen the participation of students from humanities, social, and administrative areas. The fact that more than 70% have no work experience in sustainability indicates that most are looking for their first professional approach to the field in the program. This reinforces the importance of including introductory modules, internships, mentoring, and opportunities to connect with the productive sector.

Table 1 provides detailed information on the percentages of the demographic information of students from both the UEB and UPEC.

Table 1. Demographic Background of Students for UEB and UPEC

Demographic Category	Category	UEB (%)	UPEC (%)
Gender	Woman	67.4	65.2
	Man	31.8	34.8
	Non-binary/Prefer not to say	0.8	-
Age Range	18 - 24 years	74.7	82.4
	25 - 34 years	20.8	14.1
	35 years or more	4.5	3.5
Educational Level	Undergraduate	67	-
	Graduate	33	-
	Secondary	-	26.4
	High School / Baccalaureate	-	7.9
	Higher / Third Level	-	43.2
	Sixth / Sixth Semester	-	19.0
	Other	-	3.5

Area of Training or Academic Experience	Social Sciences and Humanities	36.7	-
	Sciences (Biology, Chemistry, Physics)	19	21.1
	Economics, Finance, and Business	11.9	7.9
	Engineering and Technology	11.4	58.1
	Other	21	12.8
Work Experience in Green Businesses or Sustainability	None, I am a student or I am starting	82.3	70.9
	Less than 1 year	9.8	9.7
	1 - 3 years	5.6	11.9
	More than 6 years	2.3	7.5

Demographic Backgrounds – Professors

UPEC – The sample consists of 20 surveys answered by professors of the Universidad Politécnica Estatal del Carchi (UPEC) regarding the integration and design of the course "Strategic Leadership in Green Business". The sample is composed of professors from various academic areas, with a male predominance (65%) and extensive professional experience: 75% have more than 10 years of experience. 60% have a completed or incomplete doctorate and 40% have a master's degree or bachelor's degree. The sample is mostly composed of men. This data may reflect the teaching composition in technical and scientific areas, although the presence of women (35%) provides diversity and complementary perspectives for the development of inclusive sustainability programs. Most of the surveyed professors are between 35 and 54 years old (70%), indicating a mature academic staff with professional experience and potential to guide educational innovation processes in sustainability.

Most do not have direct experience in implementing green leadership, but they are interested in acquiring it. The professors come from areas such as engineering, social sciences, economics, and environmental sciences, which provides a multidisciplinary view for the analysis. This context reveals that the UPEC teaching community is interested in strengthening sustainability and green leadership competencies in their students, although they identify significant gaps in knowledge and skills that must be addressed through curriculum development.

75% of the professors have more than 10 years of professional experience, which ensures a high level of knowledge and ability to identify the training needs of students in green business topics. Regarding the level of education, 55% of the professors have a completed or incomplete doctorate, and 35% have a master's degree, which shows a high academic qualification. This is fundamental for the design and implementation of leadership programs in sustainability with rigor and depth. In addition, most professors do not have direct experience in green leadership, although there is a significant interest in acquiring it. This indicates the need for teacher training and updating on sustainability and strategic leadership topics.

EUB – The sample consists of 86 surveys answered by professors of the EUB regarding the integration and design of the course "Strategic Leadership in Green Business". The results show the gender distribution among respondents, with a majority identifying as men (65.9%) and a minority as women (34.1%). There is no significant representation of individuals identifying as non-binary or preferring not to disclose their gender. The gender composition in the sample reflects a male predominance, with a significant gap compared to female identification, while non-binary identities and non-responses are marginal. This disparity suggests a demographic bias in participation or limitations in the inclusion of diverse identities in the methodological design.

The age distribution of respondents, with the groups "55 years or older" and "45 - 54 years" tying for the highest percentage (37.6% each). The "35 - 44 years" group represents 20%, while the "25 - 34 years" group has the lowest representation. The age structure of the sample shows a predominant concentration in older age groups, with balanced representation in middle-aged and senior cohorts, while younger generations show reduced participation. This distribution could indicate a generational bias in sample selection or a greater thematic affinity towards adult populations. The results highlight the need to evaluate intergenerational inclusion strategies to ensure demographic diversity in future analyses.

The results show the distribution of years of professional experience, where the vast majority of respondents (81.2%) have "More than 10 years" of experience. A significant minority (9.4%) have "7-10 years" of experience, while categories with less experience (Less than 1 year, 1-3 years, 4-6 years) represent very small percentages. The sample shows a marked concentration of professionals with established careers, where most have over a decade of experience, reflecting a

bias towards senior profiles. The low representation of cohorts with less experience suggests limitations in generational diversity or possible barriers to participation. These results raise questions about the generalization of findings and underscore the need to balance representativeness in future methodological designs.

The results of the distribution of educational level, where the majority of respondents (63.5%) have a "completed Master's degree." "Incomplete PhD" represents the second highest percentage (17.6%), followed by "completed PhD" (15.3%). The sample reflects a predominance of postgraduate education, with a majority having completed Master's degrees, followed by a significant proportion in doctoral stages, both in progress and completed. This concentration suggests a highly specialized profile among the participants, possibly linked to academic or professional contexts that value deep disciplinary knowledge. The absence of basic or technical educational levels in the results indicates a sample bias towards populations with advanced educational trajectories, which conditions the general interpretation of the data in terms of demographic representativeness.

The implementation of green leadership, where the majority of respondents (38.1%) "have no experience in the implementation of green leadership." A similar percentage (32.1%) state they are very interested in gaining experience in the implementation of green leadership, while 19% have "some experience." 10.7% have experience in the implementation of green leadership. The results reveal a duality between the lack of practical experience in green leadership in a significant proportion of the sample and a substantial interest in developing these competencies, suggesting a gap in training or application opportunities. The minority with consolidated experience reflects a limited penetration of sustainable practices in current professional contexts. These data underscore the urgency of designing educational programs and transfer mechanisms that transform theoretical interest into operational capabilities, strengthening the transition towards environmentally responsible management models.

Table 2 provides detailed information on the percentages of the demographic information of professors from both the UEB and UPEC.

Table 2. Demographic Background of Professors for UEB and UPEC

Demographic Category	Category	UEB (%)	UPEC (%)
Gender	Male	65.9	65
	Female	34.1	35

Age Range	25 - 34 years	5	5
	35 - 44 years	20	35
	45 - 54 years	37.6	35
	55 years or more	37.6	25
Educational Level	Bachelor's/University Degree	10	10
	Master's or Completed Postgraduate	63.5	35
	Incomplete Doctorate or Post-doctorate	17.6	30
	Completed Doctorate or Post-doctorate	15.3	25
Years of Professional Experience	Less than 1 year	1	5
	4-6 years	1	5
	7-10 years	9.4	15
	More than 10 years	81.2	75
Experience in Implementing Green Leadership	No, I have no experience	38.1	60
	I'm interested in gaining experience	32.1	20
	I have some experience	19	10

	Yes, I have experience	10.7	10

Demographic Backgrounds – Industry Experts

UPEC – This report analyzes the results of 12 surveys that UPEC applied to representatives of various industries operating in sectors such as commerce, energy, education, agribusiness, technology, health, and consulting. The sample is diverse in terms of gender, age, and educational level, and represents industries with different degrees of progress in sustainability. The objective is to identify perceptions, challenges, required competencies, and opportunities for collaboration between academia and the productive sector to strengthen the SLGB program of the UPEC. The analysis shows the gender distribution as 7 Male and 5 females among the 12 respondents.

Regarding age range, the results show the distribution among 12 respondents, where the 25-34 age range represents the majority (50%), followed by the 35-44 age range (25%). Other ranges, such as 45-54 years (17%), and 55 years or more with 8%, show a smaller percentage.

Regarding education level, the majority of respondents (50%) have a completed master's degree (33.3%). 25% of respondents have a doctorate degree and 25% of respondents have completed bachelor's degree. Half of the respondents have postgraduate studies, and a quarter have pursued a doctorate, indicating a high level of training and capacity to lead complex innovation and sustainability processes in their companies.

UEB – This report analyzes the results of 30 surveys that UEB applied to representatives of various industries. The analysis shows an equal gender distribution, with 50% women and 50% men among the 30 respondents. The question "Gender: How do you identify?" shows an equal distribution (50%-50%) in the responses, possibly reflecting a binary polarization (Woman/Man), although the options include non-binary identities and a preference not to answer. The absence of disaggregated data for all options limits the understanding of gender diversity in the sample.

The results show the age distribution of the 30 respondents, where the 25-34 age range represents the majority (50%), followed by the 35-44 age range (23.3%). Other ranges, such as 18-24 and 45-54 years, show smaller percentages and a small fraction preferred not to disclose their age. The sample shows a predominant concentration of young adults, possibly linked to stages of professional development or active participation in specific social or work contexts. The secondary presence of a more experienced group suggests diversity in levels of stability or roles within the studied population. The low representation in extreme age ranges could reflect access barriers, lower affinity

with the topic, or generational dynamics. The reluctance of some to share their age highlights the need to address cultural or trust factors in future methodological designs.

Regarding education level, the majority of respondents (40%) have a completed university degree, closely followed by those with a completed master's degree (33.3%). Only a small portion have completed secondary education (10%) or have an incomplete university degree (10%). The sample prioritizes profiles with advanced academic training, suggesting a link to work or professional contexts that value specialization. The relevance of postgraduate studies points to a dynamic where continuous updating or competitiveness in certain sectors is central. The lower presence of basic educational levels could indicate access barriers, disconnection with the survey's focus, or methodological preferences in participant selection. The absence of educational diversity raises questions about representativeness and the need to expand inclusive approaches in future studies.

Table 3 provides detailed information on the percentages of the demographic information of industry experts.

Table 3. Demographic Background of Industry Experts from UEB and UPEC

Demographic Category	Category	UEB (%)	UPEC (%)
Gender	Male	50	58
	Female	50	42
Age Range	25 - 34 years	50	50
	35 - 44 years	23.3	25
	45 - 54 years	10	17
	55 years or more	8	8

Educational Level	Secondary	10	-
	Incomplete University Degree	10	-
	Bachelor's/University Degree	40	25
	Master's or Completed Postgraduate	33.3	50
	Doctorate (Completed/Incomplete)	-	25

Findings

This section combines the findings from both universities (UEB and UPEC) surveyed and insights from industry experts operating in different sectors. It offers a comprehensive analysis, and the survey data collected from students, professors, and industry experts revealed common and relevant themes.

Common themes emerged from all groups

Current Knowledge and Skills

Both students and professors were asked to assess university students' current level of skills and knowledge. The findings provide insights into students' existing knowledge and skills and indicate areas for improvement.

Students reported diverse levels of knowledge and proficiency in the domain of green business and sustainability. The majority of students expressed that they possess either *basic* or *no knowledge* in these areas. Students have been keen to enhance their understanding of *sustainable business models*, *leadership*, and the *circular economy*. This echoes an awareness among students regarding the importance of these fields for their potential careers and their dedication to investing in their education to address existing knowledge gaps.

In our analysis, the Professors have critically assessed the students' existing knowledge and competencies. They have highlighted that students generally *lack knowledge of conceptualizing green businesses* and *sustainable business models*. In addition, they have stressed that students lack an overall understanding of the circular economy and the *support ecosystem for green businesses*. Such a critical evaluation highlights that the potential courses must strengthen the foundations of these concepts and practical applications, and offer insights regarding *financing resources and the support ecosystem*.

Both the students and the professors agreed with the existing lack of *understanding and knowledge in green business and sustainability*. The professors have, however, more stressed the need to fill the gaps in students' understanding, particularly in the *practical application of concepts*. This difference in perspective may be because of professors' higher expertise and awareness of the skills required for success in the field. In comparison, students have been less critical of their skills and competencies for strategic leadership in the green business program.

Key Improvement areas in the skills and competencies of students

The questionnaires for students, professors, and industry experts addressed areas for improvement. Each group provided insights into the areas where students need to improve to meet the demands of SLGB program and the industry.

Students highlighted areas for improvement in their knowledge and skills. *A higher percentage of students from both universities (over 60% average) showed interest in improving their skills and knowledge in the following topics: sustainable business models, leadership skills, sustainable finance, and innovation.* They also showed a strong interest in enhancing their abilities related to the *circular economy and the entrepreneurship support ecosystem*. Their emphasis on the practical and strategic aspects of SLGB indicates that they know the essential competencies required for success in the field and are eager to refine these skills.

In addition, professors have highlighted the areas of improvement, for example, stressing the need to develop the *innovation and design of sustainable business models* (30% on average), *critical and system thinking* (30% on average), and *conception and management of green* businesses. They have emphasized the lack of understanding regarding *sustainable technologies* and the *circular economy*. They have stressed the need to develop a comprehensive and detailed understanding of sustainable business models and more practical implications of these concepts. This is aligned with what they emphasize on critical and system thinking approaches and how integrating theoretical understanding with practical knowledge and competencies would help students to prepare themselves for future challenges.

Furthermore, industry representatives offered some further insights into the areas where students need to develop their knowledge. They stressed the need for *innovation and project management skills, strategic thinking and leadership*, a detailed understanding of *sustainable technologies*, and the *integration of sustainable practices*. Industry experts also emphasized the importance of understanding *environmental policies and regulations*, the ability to develop innovative business models, and skills in sustainable project management, which are crucial for navigating the complex landscape of green and sustainable business.

Several common themes emerged while comparing these findings. Students, professors, and industry experts agree on enhancing understanding of *sustainable business models* and *leadership*. Industry experts and professors have highlighted the necessity for *innovation and practical skills*, while students emphasized *sustainable finance* and the *circular economy*. These differences in priorities reflect the changing focus of each group, with students prioritizing immediate learning needs, while industry experts and professors highlight comprehensive competencies required for success in the field.

Competencies and skills needed

The findings demonstrate that all three groups (i.e. students, professors, and industry experts) agreed on a skill gap in developing strategic leadership in green business.

The skill gap is evident from the fact that the majority of the students indicate they *have zero or fundamental knowledge* and skills in green business and sustainable entrepreneurship. However, it is also encouraging to see that most students are willing to enhance their skills in *sustainable business models*, *sustainability leadership*, *sustainable finance and investment*, *entrepreneurship support ecosystem*, *environmental policies and regulation*, and *change management in organizations and Circular Economy*. Similarly, students have shown interest in circular economy and innovation, reflecting a comprehensive and modern view of sustainability. Most students rated *leadership competencies*, *innovation and creativity*, and *actions for sustainability* as necessary competencies for strategic leadership in the green business program. Findings indicate that the program must prioritize *training for basic knowledge*, ensuring that all participants reach a solid knowledge base before addressing advanced or specialized topics. The high valuation of these areas underscores the need for programs that *integrate training in strategic decision-making, disruptive thinking*, and *practical application of sustainable principles*. This perception reinforces the importance of *aligning curriculum design* with these key competencies, linking theory, real projects, and multidisciplinary collaboration to close educational and operational gaps.

Professors highlight skills and knowledge gaps. These gaps are a *lack of knowledge in the conception of green business*, a *lack of understanding of sustainable business models*, a *lack of knowledge about the utilization of waste from the circular economy perspective*, and *a lack of knowledge about the ecosystem supporting national and international entrepreneurship*. These findings imply the critical prioritization in the conceptual training of green businesses and sustainable models, revealing structural deficiencies in the theoretical-practical integration of principles such as the circular economy. The gap in knowledge about the support ecosystem underscores the disconnection between academic training and real implementation networks, limiting the operability of projects. These gaps reflect the need for more holistic curricula that link theory, applied tools, and access to strategic networks to bridge the gap between education and sustainable action.

Industry experts highlight that the most critical competencies for graduate students are to *develop strategic thinking and leadership skills*, *solid knowledge in circular economy and climate change*, and *the ability to develop innovative business models*. They also valued skills in *sustainable project management* and *technological competencies*. It is implied that competencies for leading in green business prioritize strategic and leadership capabilities, which are fundamental for driving sustainable visions. Technical knowledge in circular economy and climate change emerges as pillars for addressing environmental challenges, while project management skills stand out as practical tools for materializing initiatives. The lower relevance assigned to other competencies suggests a focus on managerial skills and specialized knowledge, rather than on complementary operational or technological aspects.

We found several commonalities and differences in the responses of the three groups. Notably, students, professors, and industry experts agree on the importance of *innovation, leadership, and strategic thinking* in SLGB. These competencies are essential for success in the SLGB program and for addressing the complex challenges of sustainable business. However, there are also notable differences in their perspectives. Students and professors both emphasize the need for *practical skills* and the *application of knowledge*. At the same time, *industry experts emphasize specific technical knowledge*, such as the circular economy and climate change. This difference in focus reflects the varying priorities of each group, with students and professors *prioritizing practical application* and industry experts emphasizing *specialized knowledge*.

Preferred course content and methods

We asked students, professors, and industry experts for their perspectives on the best-suited methods, relevant content, and pedagogical approaches for the future curriculum of the course Strategic Leadership for Green Business. Each group provided insights into their expectations and recommendations regarding the course content and teaching methods used in the program.

Students favored a practical approach that included real-world applications and project-based learning. When we asked about your expectations for the content and structure of the SLGB course, what were they? More than 70% of students' top five preferences were: *content based on theoretical fundamentals*, *practical knowledge applied to real cases*, *networking and collaboration through interaction with professional experts*, and *guidance and monitoring for implementing learned knowledge*. More than 20% of students prioritize balancing theoretical fundamentals and practical application (case studies), with a somewhat greater inclination towards theoretical knowledge. However, as noted, there has been a demand for applied projects, interaction with experts, and implementation guides. This suggests that the combination of expectations reflects the need for an integrated approach that connects theory with actionable tools. This presents a curricular design that balances conceptual frameworks with real examples and fosters collaborative spaces that enhance soft skills and professional connections.

Regarding course format preferences, we found that students preferred *practical workshops and teamwork*, *gamification*, *schedule flexibility*, methodological *class workshops*, *expert mentorships*, and *theoretical knowledge with case studies*. It indicates that students prioritize a practical and collaborative format, highlighting workshops and teamwork as the central axis, which shows a demand for active and applied learning. The preference for theoretical classes with cases and online flexibility suggests balancing structure and adaptability. The preference for flexibility and practical workshops reveals the need to combine virtual formats with face-to-face or collaborative activities. Gamification and project-based learning can increase motivation and learning effectiveness. This trend reinforces the need for pedagogical designs integrating interactive dynamics with spaces for

theoretical reflection, ensuring engagement and development of key soft skills in sustainable leadership.

Students were also asked about preferred learning methods, and we found that *project and problem-based learning* is most popular, followed by *gamification learning*, and *directed learning*. These preferences indicate students value active and participatory methods, highlighting project/problem-based learning as the focus, followed by innovative strategies like gamification. The low preference for traditional methods ("directed learning") reflects a demand for interactive and engaging dynamics that promote practical application and motivation. This trend underscores the importance of structuring the course with collaborative approaches and innovative tools that enhance retention and engagement. The combination suggests a pedagogical design that balances real-world challenges with stimulating and contextually adapted learning experiences.

Upon asking professors about the most effective pedagogical approaches to teach such programs, we found that professors perceived *project-based learning* as the most valued, followed by the *case study approach*, and *collaborative learning* shares high effectiveness. Surprisingly, *simulations*, *mentorships*, and *Gaming* received moderate attention from the professors. While *AI* is considered the least effective approach, suggesting a preference for active and practical methods over technological approaches in this context. Professors highlighted the importance of balancing theoretical knowledge with practical application and providing opportunities for students to engage with real-world challenges. This perspective aligns with their emphasis on critical and systemic thinking and integrating theoretical knowledge with practical skills.

Industry experts promote a practical, hands-on approach to tackling challenges, emphasizing the importance of *internships*, *mentoring*, and *collaboration with industry professionals*. They stressed the need to align course content with *industry needs* and to provide students with the skills required to navigate the complex landscape of strategic leadership in green business. This highlights their emphasis on strategic thinking, leadership, and specialized knowledge in the circular economy and climate change disciplines.

Thus, all these three groups have favored a more practical and hands-on technique for learning. Where professors and students value flexibility and a combination of theoretical and practical methods, industry experts emphasize the significance of real-world applications and collaborations.

Additional Insights from different groups

Students' perspectives

Expectations from the course

The findings highlight the higher expectations that students have for the content and structure of the course, including *acquiring knowledge*, *improving the ability to answer complex questions*, and *learning*. Students foresee balancing theoretical foundations and practical applications, highlighting real-case studies and project-based learning. This preference specifies that students are seeking an educational understanding that provides them with basic knowledge and prepares them with practical competencies to handle real-world challenges. They value learning methods that are interactive and engaging, such as gamification and collaborative learning, which improve their motivation.

Challenges and needed support

Students anticipate several issues in applying green business principles in their field, mainly due to a lack of technical knowledge in sustainable and green business, and limited access to financing for sustainable projects. The main challenges perceived are the *Lack of technical knowledge in sustainability*, *limited access to financing for sustainable projects,* and *resistance to change in the industry*. To overcome these challenges, students need substantial support, including internships, mentorship, and access to interactive educational materials. They believe that practical experiences and guidance from industry experts and leaders are essential for bridging the gap between theoretical understanding and practical application.

Willingness to participate in complementary activities

This report highlights a higher interest in the program's complementary activities, such as *internships or practices in sustainable companies*. Students have also been very interested in *mentoring with experts*, *networking events*, *innovation competitions*, and *hackathons*. These activities are valuable opportunities for students to gain practical experience, build professional networks, and apply their knowledge in real-world contexts. The enthusiasm for these activities reflects students' commitment to applied learning and their wish to connect theoretical understanding with tangible real-world practical opportunities.

Specialization preferences

Students' preferences for specialization in green business, including *innovation and green technology*, *sustainability consulting, renewable energy, circular economy and waste management*, *environmental policy and regulation*, *agroecology, and sustainable production* have also been found as important values for students. These preferences identify the diverse opportunities within the green business sector and a desire to focus on specific fields that align with their interests and

career goals. This interest highlights the need for the program to offer comprehensive and updated thematic content.

Professors' Perspectives

Needed support for students

Professors highlighted the significance of resources and support mechanisms such as *internships*, *professional networks*, and *interactive digital materials* as crucial elements of the program, that help in students' development. They also emphasized the importance of *mentoring and practical experience*, which are crucial for supporting students in developing the skills and competencies required for success in the field.

Integration of the course into existing curricula

Professors recommended several ways to integrate the SLGB course into the current educational framework effectively. They recommended articulating sustainable content in related subjects, developing *ecological leadership competencies*, and applying *active methodologies* focusing on the *Sustainable Development Goals* (SDGs). Professors also proposed integrating the course content into the subjects related to *environmental management and sustainable economy*. These suggestions echo a comprehensive approach to curriculum design and development that stresses the importance of interdisciplinary learning and the integration of green business principles across various academic disciplines.

Specific topics for the course

Professors recognized several specific topics that should be included in the SLGB course to better prepare students for leadership roles in green business. These topics include *circular economy*, *innovation in ecological products and services*, *sustainable finance*, *business sustainability strategies*, and *entrepreneurship and innovation ecosystems*. This indicates an acknowledgment of the diverse and complex challenges within the green business sector and the need for a holistic curriculum that addresses these issues.

Industry Experts' Perspectives

Industry challenges

Industry experts highlighted challenges related to green business, such as *access to clean technologies* and *high implementation costs*. In addition, they highlighted the *lack of knowledge about sustainable practices* and *employees' resistance to change* as significant problems. These challenges reflect the difficulty of

transitioning to sustainable business models and the need for comprehensive strategies to address these issues.

Important values for business

Industry experts highlighted numerous crucial values for businesses, including *sustainability, innovation, quality, transparency, and social responsibility*. These values are essential for driving positive socio-environmental impact and aligning business practices with global demands for sustainability. The emphasis on these values indicates a recognition of the importance of ethical principles and operational effectiveness in achieving sustainable business goals.

Skill gaps and improvement areas

Industry experts identified several deficiencies in the training of current graduates, *including an insufficient focus on innovation and sustainable development*, a *lack of understanding of the circular economy*, and a *limited ability to integrate sustainable practices*. In addition, they highlighted the need for *training in environmental policies and regulations*, *sustainable technologies*, and the *support ecosystem for green businesses*. These insights reflect the need for an updated and holistic curriculum that addresses these gaps and prepares graduates for the complex challenges of the green business sector.

Course content and methods from an industry perspective

Industry experts encouraged a practical, hands-on approach focusing on real industry challenges. They highlighted the importance of *internships*, *mentoring*, and *collaboration with industry professionals*. Industry experts also highlighted the need for course content to be *aligned with industry needs* and to provide students with the skills required to navigate the complex landscape of sustainable business.

Conclusions

This report analyzes the collected data from students, professors, and industry experts and has provided a comprehensive understanding of the needs, expectations, and challenges related to the SLGB program. This report indicates that students rank practical skills and the application of theoretical knowledge in real-world contexts higher. They highlight the importance of competencies in sustainable and green business models, leadership in sustainability and green business, and innovation in ecological products and services. Professors highlight systemic and critical thinking, innovation in sustainable and green business models, and change management as crucial competencies. They stress the need for a comprehensive knowledge of socio-environmental challenges and the integration of strategic creativity with practical solutions. Industry experts focus on strategic thinking and leadership, knowledge of circular economy and climate change, and the ability to develop innovative business models. They value competencies in sustainable project management and technological competencies.

This report also reveals important gaps in students' current knowledge and skills, predominantly in the conception of green businesses, knowledge regarding the circular economy, and sustainable technologies. Both students and professors identify the necessity for basic knowledge in green business and sustainability, while industry experts highlight the importance of specialized knowledge and practical skills. In addition, this report highlights the importance of practical experiences, such as internships and mentorship, and the need for a strong support mechanism, including access to professional networks and interactive educational materials.

Recommendations

Curriculum development

The curriculum for the SLGB-based courses must be comprehensive and well-rounded to address the diverse needs and expectations of students, professors, and industry experts. The curriculum should integrate both *theoretical and practical* components, ensuring that students obtain a holistic understanding in sustainable and green business principles while also developing the skills required to apply these concepts in real-world contexts. Key topics that are identified and to be included in the curriculum are *sustainable and green business models, leadership in sustainability, circular economy, innovation in ecological products and services, and sustainable finance*. These topics are crucial for preparing students to navigate the complex landscape of green business and to lead initiatives that drive environmental and social impact.

The curriculum should also emphasize *interdisciplinary learning*, incorporating perspectives from various academic disciplines such as *engineering, social sciences, economics, and environmental sciences*. This approach will provide students with a comprehensive knowledge of strategic leadership and green business and enable them to address challenges from multiple perspectives. In addition, the curriculum should be *adaptable to local and global needs*, reflecting the varied contexts. This adaptability can be achieved by including *case studies* and *examples from different regions and industries*, allowing students to learn from a wide range of experiences and best practices.

Teaching methods

Effective teaching methods are crucial for the success of the SLGB-based courses. This report indicates a strong preference for *active and participatory learning methods*, such as *project-based learning*, *collaborative learning*, and *real-case studies*. These methods involve students in problem-solving and encourage them to apply their knowledge in real-world contexts. *Project-based learning*, in particular, is highly valued by students, professors, and industry experts. It allows students to work on real projects, develop practical skills, and gain hands-on experience in sustainable and green business practices.

Collaborative learning and teamwork are also crucial components of the teaching methods. These approaches foster a sense of community and encourage students to learn from each other, share ideas, and collaborate on projects. *Mentoring* by industry experts can further enhance the learning experience by providing students with guidance and insights from professionals who have practical experience in the field. *Simulations and role-playing* can be used to create realistic scenarios that challenge students to think critically and develop strategic solutions.

Flexibility in course formats is another important aspect of the teaching methods. *Online courses with flexible schedules, practical workshops, and gamification are preferred by students*. These formats accommodate different learning styles and enable students to balance their studies with other activities. *Gamification*, in particular, can increase motivation and engagement by making learning more interactive and enjoyable.

Support mechanisms

Support mechanisms are crucial for helping students succeed in SLGB-based courses. This report emphasizes the need for *internships, mentorship, and access to professional networks* as key support mechanisms. *Internships* provide students with practical experience and the opportunity to apply their knowledge in real-world settings. They also help students build professional connections and gain insights into the industry. *Mentorship by industry leaders* can offer valuable guidance and support, helping students navigate challenges and develop their careers.

Access to professional networks is another important support mechanism. *Networking events, innovation competitions, and hackathons* can offer students opportunities to connect with industry representatives, share ideas, and collaborate on different projects. These activities can enhance students' learning experience and help them build relationships essential for their future careers.

Interactive educational materials, such as *digital resources and online platforms*, can also support students' learning. These materials provide students with access to a wealth of information and tools that can enhance their understanding of sustainable business practices. *Individual or group tutoring* can offer personalized support and help students address specific challenges they may face in their studies.

Industry collaboration

Collaboration with industry is crucial for the success of the SLGB-based courses. This report indicates a high willingness from industry experts to actively participate in the program, particularly in *mentoring, internships, and innovation projects*. This collaboration can offer students valuable insights into the industry and support them develop the skills needed to succeed in the field. Industry experts can contribute to the curriculum by *sharing their knowledge and experience, participating in guest lectures, and providing real-case studies* for students to work on.

These collaborations can also help bridge the gap between academia and industry, ensuring that the curriculum is aligned with industry needs. Funding and support for sustainable startups can encourage entrepreneurship and innovation, helping students develop their ideas and bring them to market.

Specialization options

Offering specialization options within the SLGB program can cater to the diverse interests and career objectives of students. This report indicates a strong interest in areas such as *agroecology and sustainable production, renewable energy, environmental policy and regulations, circular economy, and sustainability consulting*. These specializations can offer students focused training in specific fields, allowing them to develop expertise and follow careers that are aligned with their interests.

Specialization options can be integrated into the curriculum through *elective courses, workshops, and projects* that focus on specific topics. For example, courses on agroecology can cover sustainable agricultural practices, while courses on renewable energy can explore the development and implementation of clean energy technologies. Specializations in circular economy can focus on waste management and resource efficiency, while sustainability consulting can cover environmental policies and regulations.

In conclusion, the recommendations in this report emphasize the importance of a comprehensive and adaptable curriculum, effective teaching methods, rigorous support mechanisms, active industry collaboration, and diverse specialization options. These elements are essential for creating a comprehensive and effective program that meets the needs of all stakeholders i.e. students, professors, and industry experts, and prepares graduates for leadership roles in sustainable and green business.

Figure 1 summarizes the analysis of the current state insights collected from students, professors, and industry experts from UEB and UNAD. It also offers a direction to design and develop the SLGB training programme.

Figure 1 Analysis of the Current State and Direction to Design the SLGB Training Programme

Appendix

Appendix 1 – Questionnaire for Students

1.Gender: How do you identify?
2. What age range are you in?
3. Educational Level: What is your highest level of education attained?
4. Area of training or academic experience In what area do you have training or experience? (Select the one most relevant to you)
5. Work Experience What is your level of work experience in areas related to green business or sustainability?
6. Have you had access to help for entrepreneurs?
7. What are your learning objectives for the Strategic Leadership in Green Business program?
8. What are your current knowledge and skills in areas related to green business and sustainable entrepreneurship? (1 = None, 5 = Expert)
9. What do you hope to get out of the course?
10. In which of the following areas would you like to improve your knowledge or skills?

a. Sustainable Business Models
b. Environmental Policies and Regulations
c. Sustainable Finance and Impact Investment
d. Sustainability Strategies in Companies
e. Change Management in Organizations
f. Innovation in Eco-friendly Products and Services
g. Application of Circular Economy
h. Leadership in Sustainability
i. I Don't Feel I Have Significant Deficiencies
j. Circular Economy
k. Entrepreneurship Support Ecosystem

11. What are your expectations regarding the content and structure of the Strategic Leadership in Green Business course?
12. What course format and structure would you prefer? Examples of options:

a. Theoretical Classes with Case Studies
b. Practical Workshops and Teamwork
c. Expert Lectures and Mentorship
d. Online Courses with Flexible Schedules
e. Webinars
f. Podcasts
g. Sharing Group Experiences

13. What are your preferred learning methods? Examples of options:

a. Theoretical Classes with Case Studies
b. Methodological Classes Including: Gamification

c. Self-directed Learning

14. What are your career aspirations related to green business?

15. What challenges do you think you might face when applying green business principles in your field?

16. What Would support and resources be most helpful to you in this program? Examples Options:

a. Theoretical Classes with Case Studies
b. Access to Professional Networks and Networking Events
c. Interactive Educational Materials
d. Internship or Applied Project Opportunities
e. Networking Forums for Investors
f. Hackathons
g. Accreditation with Other Advanced Training Programs

17. How important do you consider the following competencies for success in the Strategic Leadership in Green Business program?

a. Systems Thinking
b. Change Management
c. Circular Economy
d. Leadership Skills
e. Ethical Decision Making
f. Innovation and Creativity
g. Development of Sustainable Business Models
h. Incorporating Sustainability Values
i. Embracing Complexity in Sustainability
j. Imagining Sustainable Futures
k. Acting for Sustainability

18. How willing would you be to participate in complementary activities within the program?

a. Mentorship with Industry Experts
b. Internships or Placements in Sustainable Companies
c. Networking Events with Industry Leaders
d. Competitions in Sustainability Innovation
e. Hackathons or Environmental Impact Challenges

19. Sector in which you work or want to work If you work or plan to work in the green business sector, in which field would you like to specialize?

a. Mentorship with Industry Experts
b. Internships or Placements in Sustainable Companies
c. Networking Events with Industry Leaders
d. Competitions in Sustainability Innovation
e. Hackathons or Environmental Impact Challenges

Appendix 2 – Questionnaire for Professors

1. Gender: How do you identify?
2. What age range are you in?
3. How many years of professional experience do you have?
4. Educational Level What is your highest level of education attained?
5. Have you previously given training in sustainability and/or entrepreneurship?
6. *Have your students demanded content related to sustainability and/or entrepreneurship in the past?*
7. Have your students come to you in the past for business advice?
8. Do you have experience in implementing Green Business Models?
9. What are the key competencies and skills that students need to succeed in the Strategic Leadership in Green Business program? (Select up to 3 options)
    a. Critical and Systems Thinking
    b. Change Management and Leadership
    c. Innovation and Design of Sustainable Business Models
    d. Skills in Circular Economy
    e. Logical and Computational Reasoning
    f. Research and Experimentation Skills
    g. IT Tools Management
    h. Data-driven Decision Making
10. What are the main gaps in knowledge and skills that you have identified in students regarding green business and sustainable entrepreneurship?
11. What level of difficulty do you consider most appropriate for the different modules of the Strategic Leadership in Green Business program, taking into account that the profile of the students is senior undergraduate and/or graduate students?
12. What specific topics do you think should be included in the Strategic Leadership in Green Business program to prepare students in this field?
13. What pedagogical approaches would be most effective for teaching the program? (Select up to 3 options)
    a. Project-based Learning
    b. Case Studies of Real Companies
    c. Simulations and Role-playing Games
    d. Collaborative Learning and Teamwork
    e. Mentorships with Industry Experts
    f. Gamification
14. What resources and support would be most beneficial to students? (Select up to 3 options)
    a. Individual or Group Tutoring
    b. Access to Industry Contact Networks
    c. Interactive Digital Materials
    d. Internship or Professional Practice Programs
    e. Working with Real Industry Challenges
    f. Videos

15. What is your area of academic training?
16. In what area of knowledge do you have academic experience?
17. How can the Strategic Leadership in Green Business program be effectively integrated into existing curricula?

Appendix 3. Questionnaire for Industry Experts

1. Gender: How do you identify?
2. What age range are you in?
3. Educational Level What is your highest level of education attained?
4. Have you worked with technology companies before to market products or services (startups)?
    a. If you answered **yes** to the previous question, how would you describe your experience working with startups?
5. Do you measure carbon emissions in your company?
6. Does your company currently collaborate with universities on innovation or research projects?
7. What sustainability actions does your company currently carry out? *(Select all that apply)*
8. What are the main current challenges in the green business sector?
9. What obstacles does your industry face in becoming more sustainable?
10. What values do you consider most important to your business, ordered from most to least important?
    a. Integrity
    b. Innovation
    c. Sustainability
    d. Quality
    e. Transparency
    f. Social Responsibility
    g. Customer Orientation
    h. Teamwork
    i. Efficiency
    j. Respect
11. What skills do you consider essential for graduates seeking to lead the field of green business?
12. Does your organization value sustainability more than profits, or is it the other way around?
13. What are the main shortcomings in the training of current graduates in relation to green business?
14. What are the emerging trends in the sector that should be addressed in the course?
15. What role can graduates play in driving innovation and sustainability in their company or sector?
16. Are there specific projects or collaborations that could be developed between the University and industry in this field?
17. *How willing would you be to participate in complementary activities within the training program?*
18. **Area of training or academic experience** In what area do you have training or experience? (Select the one most relevant to you)
    a. Sciences (Biology, Chemistry, Physics, etc.)
    b. Engineering and Technology

c. Economics, Finance, and Business
d. Environmental or Sustainability Sciences
e. Social Sciences and Humanities

19. Sector of your industry?

What are your recommendations for the design of the green business program?1. Gender How do you identify?

2. What age range are you in?
3. Educational Level What is your highest level of education attained?
4. Have you worked with technology companies before to market products or services (startups)?
    a. If you answered **yes** to the previous question, how would you describe your experience working with startups?
5. Do you measure carbon emissions in your company?
6. Does your company currently collaborate with universities on innovation or research projects?
7. What sustainability actions does your company currently carry out? *(Select all that apply)*
8. What are the main current challenges in the green business sector?
9. What obstacles does your industry face in becoming more sustainable?
10. What values do you consider most important to your business, ordered from most to least important?
    a. Integrity
    b. Innovation
    c. Sustainability
    d. Quality
    e. Transparency
    f. Social Responsibility
    g. Customer Orientation
    h. Teamwork
    i. Efficiency
    j. Respect
11. What skills do you consider essential for graduates seeking to lead the field of green business?
12. Does your organization value sustainability more than profits, or is it the other way around?
13. What are the main shortcomings in the training of current graduates in relation to green business?
14. What are the emerging trends in the sector that should be addressed in the course?
15. What role can graduates play in driving innovation and sustainability in their company or sector?
16. Are there specific projects or collaborations that could be developed between the University and industry in this field?
17. *How willing would you be to participate in complementary activities within the training program?*
18. **Area of training or academic experience** In what area do you have

training or experience? (Select the one most relevant to you)

a. Sciences (Biology, Chemistry, Physics, etc.)
b. Engineering and Technology
c. Economics, Finance, and Business
d. Environmental or Sustainability Sciences
e. Social Sciences and Humanities

19. Sector of your industry?

What are your recommendations for the design of the green business program?