

# Organizational Learning Towards Sustainability in Higher Education Institutions: A Brazilian Case Study

Vanessa de Campos Junges<sup>1</sup>, Simone Alves Pacheco de Campos<sup>1</sup>, Rúbia Goi Becker<sup>1</sup> & Daniele Medianeira Rizzetti<sup>1</sup>

<sup>1</sup> Federal University of Santa Maria, Santa Maria, Rio Grande do Sul, Brazil

Correspondence: Simone Alves Pacheco de Campos, Federal University of Santa Maria, Center for Social and Human Sciences, Graduate Program in Administration, Roraima Avenue, N. 1000, Postal Code: 97105-900, Building 74B – Room 3237, Santa Maria, Rio Grande do Sul, Brazil.

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## Abstract

Universities should be dedicated to providing an education that fosters social transformation by interrelating the environmental, social, and economic dimensions. This article asserts that a truly sustainable university extends beyond merely “greening” the campus—it emphasizes sustainability across all core processes, be it in education, management, research, or community relations. The primary aim of this study is to delve into organizational learning and sustainable management processes, drawing inspiration from the I3E model introduced by Cebrian (2016). A qualitative case study was undertaken at a Brazilian federal university listed in the UI GreenMetric World University Rankings to achieve this. The research thoroughly examined institutional documents and interviews with managerial staff to discern strategic decisions, sustainable initiatives, and best practices. The findings suggest that the journey towards learning for sustainability is riddled with challenges, such as a paucity of commitment, communication gaps, ineffective leadership, distrust within the institution, limited funding, conflicting interests among various groups and individuals, and the burden of rigid bureaucratic protocols. However, facilitating factors have also been identified, including reshaping pre-existing mental models, a genuine interest in learning, and a conducive organizational framework. This research enriches the existing discourse on sustainability and organizational learning and offers a comprehensive and interconnected perspective on these topics. Additionally, it delivers valuable insights for academic administrators aspiring to craft a blueprint for a sustainable university. It does so by addressing overarching challenges and placing the components of the institutional management model in context, thereby offering direction for sustainable core processes in areas such as teaching, research, outreach, and management.

**Keywords:** sustainable university, I3E model, organizational learning

## 1. Introduction

Universities, as Higher Education Institutions (HEIs), are responsible for championing education that catalyzes social transformation. This transformation is rooted in the intricate nexus of the environmental, social, and economic realms (Berchin, Dutra, & Guerra, 2021; Wright, Ritter, & Gonzales, 2022). With the imperative of embedding sustainability into both their operational fabric and curriculum (Alba, 2017; Lozano et al., 2013; Junges, 2023), universities find themselves at the crossroads of an encompassing transformation toward sustainability (Berchin, Dutra, & Guerra, 2021; Cebrián, 2016; Cebirán, Grace, & Humphris, 2013; Junges, 2023; Lozano, 2006).

The prominence of HEIs as flagbearers of sustainability was augmented by the agenda of Education for Sustainable Development (2005–2014) and the Sustainable Development Goal 4.7 of the 2030 Agenda (Correa, 2019; Shulla, Filho, Lardjane, Sommer, & Borgemeister, 2020; Ruiz-Mallén & Heras, 2020; Trechsel et al., 2018). In this light, exploring models that encapsulate a university's unwavering commitment to sustainability across its spectrum of activities has burgeoned as a pivotal area of research in sustainability (Cebrián et al., 2013, 2016).

A significant tranche of research in the domain of sustainability within HEIs revolves around initiatives of campus greening and environmental stewardship (Sammalisto & Lindhqvist, 2008). These efforts often pertain to specific academic courses (Figueiró, Da Silva, & Philereno, 2019; Gonçalves-Dias, Herrera, & Cruz, 2013; Jacobi, Raulfflet, & Arruda, 2011; Mannes et al., 2018; Melo & Brunstein, 2014), emphasizing standalone best practices

and the infusion of sustainability. This underlines a nascent and evolving research frontier, especially when it concerns the seamless integration of sustainability across the university's core functions (Cebrián et al., 2013, 2016). Yet, given the intricate nature of university activities and their mutual dependencies, the birth of a sustainable university demands a comprehensive embrace of sustainability, ranging from visionary strategies to hands-on operations. This sweeping transformation is a burgeoning research niche (Berchin, Dutra, & Guerra, 2021; Cebrián, 2016; Jones, Triery, & Richards, 2010). Echoing this sentiment, this article posits that the vision of a sustainable university transcends merely greening the campus; it is meticulously crafted through a learning journey inspired by the I3E model.

Sustainability's integration as a metamorphic journey of organizational learning galvanizes the community and paves the way for structural progression towards sustainability (Tilbury, 2011). Rooted in this philosophy, our research underscores the belief that relentless learning and reevaluating practices and personal beliefs within an institution can ripple out to the broader community, culminating in organizational enlightenment (Cebrián et al., 2013).

With the I3E model as our compass, this work paints a portrait of the organizational learning trajectory intertwined with the evolution of a sustainable university, straddling realms like management, academia, research, and outreach. This exploration offers valuable insights for academic leaders yearning to sculpt a blueprint for a sustainable university. It illuminates the broader challenges, while nestling the facets of the institutional management model in their apt context, thus guiding sustainable core practices in teaching, research, outreach, and governance. Moreover, this research seeks to amplify the academic discourse on weaving sustainability into the university framework, drawing from the theory of organizational learning, and furnishing actionable insights for scholars and practitioners. In terms of tangible outcomes, our study furnishes a comprehensive guide poised to be adopted by leaders across all pivotal institutional activities. This guide champions the active engagement of the academic fraternity in realizing the vision of a sustainable university.

The ensuing sections of the article will unfold as follows: a succinct literature review centered on organizational learning, followed by a delve into models and studies on sustainable universities, with a spotlight on the I3E model. Subsequent sections detail the methodological strategy, empirical findings, ensuing discussions, and the implications of our discoveries. The article culminates with a concise conclusion.

## **2. Organizational Learning**

Organizational learning spans a broad spectrum of knowledge and occasionally encounters disputes within organizational theory. While many definitions exist, there are shared and complementary theoretical understandings (Basten & Haamann, 2018; Boreham & Morgan, 2004; Crossan, Lane, & White, 1999; Robinson & Cassandre, 2019; Wang & Ahmed, 2003). Broadly speaking, organizational learning bridges individual and group learning processes. This bridge can be examined from diverse theoretical perspectives: behavioral, cognitive, pragmatic, or situated (Basten & Haamann, 2018; Robinson & Cassandre, 2019; Sauquet, 2004; Ye, 2002).

Prominent figures in organizational learning include Argyris and Schön (1996). They perceive organizational learning as an outcome of organizational inquiry. This inquiry manifests as changes in prevailing theories, deeply embedded in individuals' organizational mental models or the epistemological artifacts, such as maps, memories, and programs, within the organizational milieu. Contrarily, Kim (1998) envisions organizational learning as a process ignited by individuals. Here, the individuals' knowledge is tethered to their learning aptitude, amplifying their ability to execute effective actions that bolster performance. This notion aligns with Fiol and Lyles (1985), who emphasize enhancing actions, comprehension, and knowledge.

Several factors bolster or impede the organizational learning trajectory, as highlighted by Caldeira and Godoy (2011). They consolidated influential aspects of learning, drawing from the insights of esteemed authors in the field, as depicted in Table 1. Embracing this theoretical scaffolding allows for an amalgamation of diverse theoretical inputs, shedding light on the accelerators and barriers of organizational learning inherent in the evolution of a sustainable university.

Table 1. Aspects that facilitate or hinder learning in organizations

Authors	What Makes it Easier	What Makes it Difficult
Friedman, Lipshitz and Overmeer (2001); Scherer and Tran (2001).	Error tolerance, without punishment; Judgment based on facts above political interests; Equality in the division of power and responsibility; Organization's commitment to learning.	Rigorous punitive systems, intolerant of error; Beliefs and interests of individuals and specific groups; Lack of balance in the division of power and responsibility; Lack of employee motivation to learn.
Argyris and Schön (1996); Berthoin Antal, Lenhardt and Rosenbrock (2001); Cannon and Edmondson (2001); Edmondson (1999, 2002, 2008); Kim (1993); Schein (1993); Starbuck and Hedberg (2001).	Favorable climate for change and innovation; Deconstruction of current mental models; Sharing beliefs and perceptions; Integrated and systemic vision; Effectiveness in the communication process.	Defensive attitudes; Mental models built by experience; Difficulty in unlearning; Dissonant perceptions between individuals and groups; Fragmented learning; Incomplete reflection; Truncated and incomplete communication process.
Fiol and Lyles (1985); Morgan (1996).	Flexible organizational structures that draw individuals' attention to interdepartmental cause-and-effect relationships.	Centralized and departmental organizational structures.
Sadler (2001).	Leaders with the humility to recognize limits and admit the need to learn.	Wise leaders, liberated from learning.
Argote et al. (2021)	The organizational context, which includes both characteristics of the environment external to the organization, such as its competitiveness or degree of regulation, as well as internal characteristics of the organization, such as its structure, culture, and identity, affect learning and some contexts facilitate learning, while others prevent it.	The organizational context, which includes both characteristics of the environment external to the organization, such as its competitiveness or degree of regulation, as well as internal characteristics of the organization, such as its structure, culture, and identity, affect learning and some contexts facilitate learning, while others prevent it.
Crossan et al. (2022)	strength of individual character enhances organizational learning	How unbalanced or weak character undermines organizational learning
Doro (2022)	The relationship, motivation, and acquisition of skills, as well as the recognition of the need for cultural change, an effective information system, and a positive financial situation.	Oppressive culture, internal competition, resistance to change, rigid structure, and failure in internal communication.
Gunawan et al. (2022)	Sociocultural and political issues are important for sustainability	Sociocultural and political issues are important for sustainability

Sources: Adapted from Caldeira and Godoy (2011), Argote et al. (2021), Crossan et al. (2022), Doro (2022), and Gunawan et al. (2022).

In elucidating the facilitating aspects of learning, Friedman, Lipshitz and Overmeer (2001) emphasize contextual factors such as tolerance for error, judgment based on facts, egalitarian distribution of power and responsibility, and an overarching organizational commitment to learning. Psychological dimensions like doubt, leading to critical questioning, and the presence of psychological safety are also highlighted. Behavioral characteristics are deemed critical, including transparent access to information, a propensity for critical evaluation, setting personal beliefs and interests aside, and taking ownership of one's actions and repercussions.

Moreover, the notion of power distribution equality, underpinned by a flexible and decentralized organizational structure, is another favorable factor for learning (Fiol & Lyles, 1985; Morgan, 1996). However, while such equality can spur change and innovation, it can sometimes hinder full commitment (Scherer & Tran, 2001). For Caldeira and Godoy (2011), power dynamics can impede learning, especially when group members dispute.

A significant component influencing learning is deconstructing mental models, codified alterations accrued over time (Kim, 1993). These models arise from past experiences and significantly influence how individuals strategize and act (Argyris & Schön, 1996; Senge, 2003). Additionally, a shared vision of beliefs and perceptions, combined with continuous reflection and action, is pivotal for organizational learning (Edmondson, 2008). The role of leaders in this process cannot be overstated; their actions can either cultivate or stifle the learning process (Sadler, 2001).

Conversely, barriers to organizational learning have been identified. Argyris and Schön (1996) introduce the concept of defensive routines, which are strategies and policies formulated to insulate individuals from perceived

threats. Kim (1998) further details various hindrances to learning, such as role-bound and superstitious learning. Berthoin Antal, Lenhardt and Rosenbrock (2001) also highlight the impact of interrupted learning processes, cultural and psychological barriers, and challenges related to organizational structure and leadership on the broader context of organizational learning. Studies have pinpointed several hindrances, such as the concealment of errors and communication lapses (Cannon & Edmondson, 2001; Edmondson, 1999, 2002, 2008; Robinson & Cassandre, 2019).

Furthermore, Doro (2022) emphasizes that fostering relationships, nurturing motivation, honing skills, recognizing the imperatives of cultural shifts, leveraging effective information systems, and maintaining a favorable financial backdrop are catalysts for organizational learning. In contrast, oppressive cultural norms, internal rivalries, resistance to change, and communication breakdowns can stymie the learning process.

Given the importance of sustainability, evaluating both the facilitators and inhibitors of organizational learning in this context is paramount. Gunawan et al. (2022) assert the significance of sociocultural and political dynamics in this equation. Thus, organizational learning surfaces as a critical pathway for integrating sustainability into HEIs (Sharp, 2002; Thomas, 2004), emphasizing an understanding of how they navigate their learning journeys and the factors that either support or hinder their progress toward sustainability and their continuous evolution, making them adept in the realm of sustainable transformation (Sharp, 2002).

### 3. Sustainable University

The most well-known definition of sustainability is from the 1987 Report by the World Commission on Environment and Development (1987), referring to the ability of human society to continue indefinitely. In the field of HEIs, there is a growing effort to integrate sustainability into their strategies, committing to sustainable actions and practices due to the importance of educational formation in disseminating knowledge in such organizations, which carry the responsibility of promoting actions for social transformation towards sustainability (Wals, 2014; Karatzoglou, 2013; Ramos, Caeiro, Hoof, Lozano, Huisingsh, & Ceulemans, 2015; Fogarassy et al., 2018).

Thus, Chankseliani and Mcowan (2021) argue that this dynamic is privileged by the existing interaction among students, teachers, and staff, reinforcing the role of HEIs as agents of change, since teaching, research, and social engagement realities permeate their daily lives. Müller-Christ et al. (2014) base their study on the roundtable developed by experts at the 4th UNESCO Chair Conference on Education for Sustainable Development to discuss the contributions of HEIs regarding campus, curriculum, and the academic community. In this regard, these researchers list some key points about the campus, namely: (i) well-being: the institution promotes interdisciplinary and transdisciplinary actions within and beyond the campus, as well as encourages openness for students to create, feeling motivated; (ii) involvement of the entire institution, especially top management: shaping a new direction should be based on the entire academic community to truly have differentiated effects; (iii) communication: making communication within and outside the institution a key aspect for sustainable direction, disseminating practice-consistent information, demonstrating trust and ethics; (iv) linking campus sustainability as an institutional responsibility: acting to pursue actions and practices that reflect sustainability must be an obligation of HEIs; (v) innovative potential: developing innovations in all scopes, using the different areas of learning that shape the institution, as well as developing partnerships to innovate; and (vi) going beyond the institution's campus: making space for the community to contribute to sustainable direction, creating a collaborative and participatory process, giving voice to others involved.

Furthermore, the mentioned authors argue that for consistent sustainability-oriented changes within institutions, campus, curriculum, and the community must be treated in an interconnected manner, arguing that working on transdisciplinarity involves more than new curriculum approaches but also has consequences for the relationship between the university and the community. The same applies to the cooperation of researchers, students, and professionals, such as campus consumption-related suppliers. Therefore, participatory processes that have openness, cooperation, and dialogue are relevant for building a sustainable institution, making it easier to visualize existing opportunities (Müller-Christ et al., 2014).

In this sense, Lozano et al. (2015) complement the theory on the subject by stating that sustainability must be linked to all processes of HEIs, being a reflection and reference in their policies and strategies, outlining and developing sustainable principles, as well as creating means for short, medium, and long-term planning. However, it is important to highlight that, according to Gale, Davison, Wood, Williams and Towle (2015), there are four obstacles to incorporating education for sustainable development, namely: (i) contestation about sustainability, requiring an approach for operationalization; (ii) intra-institutional fragmentation, hindering interdisciplinarity; (iii) academic capitalism, where higher education is redirected to boost economic competitiveness and capital

accumulation; and (iv) cognitive predispositions, leading collaborators to focus on economic aspects and political interests. Therefore, these factors impact the transition to sustainability in the context of universities, so for this transition to occur, more than one sphere needs to be addressed, such as the structuring of academic curricula (Lozano-García Gandara, Orietta, Mario, Elia, & Donald, 2008; Fiselier, Longhurst, & Gough, 2018), knowledge generation (Miller, Muñoz-Erickson, & Redman, 2011), and sustainable management and operations (Maruyama, Trigo, & Trigo, 2022).

Furthermore, according to the findings of Fiselier, Longhurst and Gough (2018), the process of integrating sustainability into HEIs requires support and commitment from the whole, not the exclusivity of a group of employees, but from senior leaders, professional administrators, and academic staff. In conclusion, a university oriented toward sustainability can go beyond isolated actions (Parris & McInnes-Bowers, 2017), proposing a systemic change in the educational paradigm (Lotz-Sisitka, Wals, Kronlid, & McGarry, 2015; Sterling, 2004). Therefore, in addition to teaching and learning issues, curricular change, and professional development (Anastasiadis et al., 2020), the transformation of HEIs involves sharing a set of sustainable skills, enabling the holistic integration of sustainability, thus shedding light on the dynamics of organizational change (Levesque & Wake, 2021). By encompassing broader and general structures of the institutions' core processes, it is believed that their transformations toward sustainability are possible (Iyer-Raniga & Andamon, 2016).

#### 4. Organizational Learning for the Construction of a Sustainable University: Incorporating the I3E Model

Universities' growing inclination towards adopting an environmentally conscious stance is increasingly evident, especially given the escalating negative repercussions of unsustainable practices on the environment, society, and economy. Cebrián (2016) posits that in response to various sustainability crises, whether they manifest locally, regionally, or globally, universities must embark on a profound learning journey. This journey necessitates a reorientation, which can be conceptualized as a form of unlearning. With this backdrop, the author developed the I3E Model. This model is crafted to instill a sustainable trajectory in campus management. It underscores the importance of information, engagement, empowerment, and qualification. These elements are intricately interwoven and mutually reinforcing, prompting a foundational transformation within the university. The core tenets of the I3E Model, as delineated by Cebrián (2016), are listed in Table 2.

Table 2. Elements of the I3E Model

Element	Central Points
Inform	Disseminate and communicate, develop a strategic vision, build ethical awareness, and create space for professional development.
Engage	Develop partnerships, foster organizational leadership and support, create participatory processes, and assign role models.
Empower	Foster curriculum innovation, ensure quality processes, develop research criteria, and foster sustainability in course centers.
Qualify	Optimize time and resources, reconfigure systems, develop collaborative and interdisciplinary work, and guide actions toward transformative learning.

Source: Developed based on Cebrián (2016).

In this context, the I3E Model is perceived as a strategic blueprint that navigates the university toward an authentically sustainable direction. As the university integrates the model's elements, these components begin to influence and shape other critical domains, such as teaching, research, and outreach (Cebrián, 2016). This suggests that assimilating sustainability and the ongoing journey of embedding it are inherently linked and integral to the organizational learning paradigm (Iyer-Raniga & Andamon, 2016). Aligning with the insights of Ryan (2011), this study contends that a university oriented towards sustainability is committed, both institutionally and resource-wise, to pioneering projects, leadership initiatives, and professional advancement. In essence, it champions a comprehensive metamorphosis to weave in sustainability. This transformative journey is optimally facilitated through organizational learning, which can be effectively channeled through the I3E Model.

#### 5. Method

This research was conducted based on a qualitative case study (Yin, 2015) at a Brazilian Federal University. The method for this research was rooted in a qualitative case study approach, as proposed by Yin (2015). The study was situated at a Brazilian Federal University, hereafter denoted as HEI-1. Notably, HEI-1 is listed in the UI GreenMetric World University Rankings. In 2022, it secured a position among the top twenty universities in Brazil. Additionally, it was recognized among the premier ten institutions that have shown remarkable strides towards the Sustainable Development Goals (SDGs). It has particularly made advancements concerning Goal 1, which

pertains to the eradication of poverty, and Goal 2, which centers on achieving zero hunger and promoting sustainable agriculture. Data were collected from institutional documents and websites and through interviews conducted with selected university administrators using the snowball sampling technique (Biernacki & Waldorf, 1981), as outlined in Table 3.

Table 3. List of respondents

HEI	Interviewee	Interview duration
HEI-1	Rector	1h13min25s
	Vice-Rector	1h9min29s
	Community Relations Manager	59min2s
	Manager of Undergraduate Studies	55min33s
	Manager of Infrastructure	59min25s
	Manager of Planning	31min06s
	Employee of the Environmental Planning Sector	41min23s

Source: Developed by the authors (2023).

After data collection, the interviews were transcribed as guided by Milford et al. (2017). Both the transcribed interviews and the documentary data were meticulously organized in line with the method suggested by Azungah (2018). Before transcription and organization, we conducted a data analysis grounded in the content analysis technique of Bardin (2016). This technique encompassed an inductive examination of interviewees' perceptions and experiences about organizational learning steering towards sustainability, subsequently informing the codification process (Azungah, 2018).

Categorization was conducted according to Grodal, Anteby and Holm (2021). Our approach was anchored in theoretical foundations to demarcate categories and aligned with the core research objectives: understanding the university's learning process and the foundational aspects of building a sustainable university. Concerning the learning process of the university, we bifurcated it into two thematic areas or micro categories, given our interest in both learning facilitators and inhibitors. Similarly, the second category was sculpted based on Cebrian's (2016) I3E model. Notably, our categorization drew exclusively from predefined literature categories; hence, we undertook the codification of data, categorizing the corpus of data based on codes that facilitated the labeling and organization of information, making it more accessible for analysis. We utilized text spreadsheets to facilitate data organization and categorization during this process. This methodological approach was instrumental in pinpointing data patterns that enriched our analyses. Table 4 encapsulates the categories, themes, principal concepts, and their theoretical support.

Table 4. Analytical categories

Categories	Micro Categories	Theoretical Basis
The University's Learning Process	Learning facilitators	Caldeira and Godoy (2011)
	Learning inhibitors	
Building a Sustainable Foundation in the University	I3E Model	Cebrián (2016)

Source: Developed by the authors (2023).

## 6. Results, Discussions, and Implications: The University's Learning Process

The HEI-1, situated in central Rio Grande do Sul State (southern Brazil), embodies the pressing need to manifest its transformation towards sustainability. This commitment is underscored by the Rector's declaration: "The university is a public university, isn't it? It belongs to the people. This is not proselytism or demagoguery. The university belongs to the people!" This statement from the Rector's speech underscores an urgency to foster an environment transcending mere sustainability, especially as global demands for such initiatives intensify.

Importantly, the institution amplifies its social commitment, an essence captured in the Rector's emphasis that it is for "the people." Building on this, Munasinghe (2002, 2019) underscores the significance of addressing environmental, social, and economic dimensions to cultivate a more sustainable development trajectory. Additionally, the Vice-Rector suggests the institution's imperative to fortify connections, particularly among its collaborators, to forge a shared vision. This sentiment is echoed by the Community Relations Manager, Manager of Undergraduate Studies, and Manager of Infrastructure, who collectively opines that the institution should not be

an impersonal entity represented by just a few individuals.

The palpable need is for the institution to nurture a culture that resonates with all its stakeholders, emanating from a collective discourse. However, achieving this desired collective alignment is challenging due to the intricate web of individual complexities and diverse objectives, as stated by the Vice-Rector. The Manager of Planning accentuates this sentiment, emphasizing the necessity for an institutional sustainability ethos that surpasses isolated practices in specific courses and instead gravitates toward holistic, strategic university projects. The Rector concurs, noting that while the institution pursues noteworthy sustainability initiatives, it lacks cohesion.

The prevailing theme is the fragmented nature of sustainability efforts within the institution, underscoring the urgency to transcend this individualism and perceive sustainability as the institution's bedrock. The Manager of Undergraduate Studies observes sustainability-driven practices but identifies constraints, notably the entrenched belief that professors should exclusively teach, sidelining research and outreach endeavors. Such a narrow view curtails commitment, potentially stymieing the organizational learning process, especially if sustainability is not recognized as a pivotal pursuit (Leite & De Aquino, 2008).

Corroborating this, the Community Relations Manager advocates for enhanced cohesion, highlighting the isolated nature of current institutional actions, which compounds the sustainability transition challenge. A salient issue emerging from the discourse is the institution's internal and external communication challenges. This encompasses truncated communication, inaccessible to the broader community, and a tendency for certain processes to be deliberately protracted. Such observations align with insights from Doro (2022) and Rossato (2017), who suggest that obstructed information dissemination can significantly impede the learning process, fostering hierarchical instability and a reluctance to champion change.

Nevertheless, while acknowledging these institutional shortcomings, the Vice-Rector underscores their substantial contributions, stating, "We play a huge role. I'm showing you where our flaws are, but I'm not saying that we're not doing anything, right?" This highlights the necessity to galvanize greater institutional commitment from both management and employees, fostering leadership that catalyzes the institution's learning journey, as delineated by Caldeira and Godoy (2011), Leite and De Aquino (2008), and Sadler (2001). Moreover, as a federally affiliated entity, HEI-1 is often impacted by governmental budgetary allocations. Such fiscal constraints can curtail sustainability investments, especially when more immediate concerns are prioritized. To encapsulate and elucidate the identified facilitators and inhibitors inherent in HEI-1's learning trajectory, Table 5 has been formulated.

Table 5. Summary of facilitators and inhibitors of the HEI-1 learning process

Facilitators	Inhibitors
Deconstruction of mental models: there is a perception that current practices are not enough and that several gaps must be filled.	Lack of commitment: a considerable number of employees are not engaged in the cause of sustainability.
Interest in learning: they managed to understand over time how the institution works and what the needs are, seeking to meet them.	Communication: both internal and external, it is an obstacle, with slow processes that do not always reach all interested parties.
Holistic view: actions developed by management to contribute to institutional impersonality, highlighting the need for a broader view.	Leadership: fails to promote ways to involve employees in pursuit of the mission, vision, and values.
Organizational structure: they intend to develop a more fluid structure, making processes more agile.	Fear of sharing information: the internal and external communication process is flawed, limiting everyone's knowledge and being trapped in the hierarchical system.
	Different interests between groups and individuals: the understanding of sustainability is not common, and communication is slow due to the lack of interest in certain processes with continuity.
	Financial situation: it undermines investments aimed at sustainability.
	Rigorous and punitive systems: as a federal HEI, it depends on government decisions, in which the budget, legislation, and hiring of personnel become an obstacle to sustainability actions.

Source: Developed by the authors (2023).

## 7. Results, Discussions, and Implications: Building a Sustainable Foundation in the University

Through the initiatives of the Community Relations Manager and the Agenda 2030 Commission, the university has cultivated an environment conducive to promoting and implementing practices in line with the 17 SDGs. There is a pronounced emphasis on quality education, peace, justice, and partnerships, all aimed at fostering the common good grounded in sustainable development. This commitment is evident both on the institution's website and through the insights shared by the Community Relations Manager.

All projects within HEI-1 are required to define their primary focuses and associated objectives. Additionally, the institution holds regular workshops to amplify the development of practices that align with Agenda 2030. The university established the Permanent Regional Community Relations Forum to foster community engagement. Through this platform, community members can prioritize pressing demands. The institution also circulates a newsletter detailing the Agenda 2030 objectives and how they can be advanced through grassroots initiatives. Another pivotal initiative is Project X, which zeroes in on environmental concerns. It advocates for heightened consciousness regarding the utilization of renewable resources and spearheads initiatives such as sustainable purchasing, preservation zones, selective waste collection, energy efficiency, and controlled product management. These efforts are publicized on the institution's website and underscored by the Community Relations Manager.

From the aforementioned and in an effort to understand if HEI-1 is engaged in sustainable management, it is analyzed through the I3E Model (Cebrián, 2016, 2020). In this context, just like other HEIs, the institution is immersed in complex factors that envelop its management, particularly in terms of sustainability. As articulated by the Rector and the Vice-Rector, internal and external communication emerges as a significant hurdle for HEI-1. The fragmentation in communication hampers a collective understanding, leading to process inconsistencies. Effective communication is instrumental for sustainable management as it entails informing all stakeholders, thereby fortifying the organizational culture (Cebrián, 2016, 2020), thus being one of the shortcomings of HEI-1.

In terms of engagement, there is an evident barrier to fostering interdisciplinary collaboration among employees. This sentiment resonates with the views of the Associate Vice-Provost for Outreach, the Associate Vice-Provost for Infrastructure, the Associate Vice-Provost for Undergraduate Studies, the Vice-Provost for Planning, and the Vice-Rector. While the institution's leadership champions coordinated endeavors, there is a palpable reticence among different factions to step out of their silos. Cebrián (2016) posits that engagement is intertwined with management, and leadership plays a pivotal role in orienting an HEI towards a shared mission. A plausible explanation for this fragmented engagement could be the frequent changes in leadership roles, which hinder the establishment of enduring trust, allowing individual or factional interests to dominate.

Addressing qualification at HEI-1, the institution's commitment is evident in creating a sustainability center, a derivative of Project X. This initiative emphasizes environmental consciousness and champions actions that engender collective responsibility. The Project's digital platform provides comprehensive insights into HEI-1's initiatives concerning water, energy, paper consumption, waste management, and more. Furthermore, it offers podcasts discussing socio-environmental topics and sustainable living tips. Additionally, as elucidated by the Community Relations Manager and institutional documents, there is a dedicated platform aligned with Agenda 2030, aiming to discern the SDGs that resonate most with the community.

Thus, with initiatives such as Project X and Agenda 2030, HEI-1 has taken substantial steps in its sustainability journey. Such coordinated efforts corroborate Cebrián (2016) in that HEIs require more than just ethical committees—they require transformative actions that usher in a fresh perspective on the institution and education. To encapsulate and emphasize each element of the I3E Model observed at HEI-1, Table 6 was developed.

Table 6. The I3E Model at HEI-1

Inform	Engage
Dissemination and communication: configures while failing. Build awareness: some actions are aimed at sustainability, but it is difficult to practice due to escaping the scope due to government dependence, for example.	Leadership and organizational support: demonstrates failure due to not being able to promote the necessary involvement of individuals. Participatory process: individual and/or group interests prevail.
Qualify	Empower
Curricular innovation: it stands out from the curricularization of the extension. Sustainability center and positions: Project X and Agenda 2030 were developed.	Time and resources: Significant cuts in the institution's budget make it difficult to move forward. Collaboration and interdisciplinary work: there is great resistance to perceiving the HEI collectively.

Source: Developed by the authors (2023).

Therefore, through the interplay of elements from the I3E Model (Cebrián, 2016) and their manifestation in HEI management, vulnerabilities emerge that could transform into institutional strengths when appropriately addressed. As evident from the interviews, the initial step has been taken, as the interviewees recognized their weak points. Consistent with the understanding presented in this study, it is believed that the principles of the I3E Model will lay the foundation for the evolution of sustainable management, driving initiatives in teaching, research, and outreach.



While HEI-1 has not yet fully realized the sustainable management its administration envisions, it is clearly progressing towards this objective.

In conclusion, our findings suggest that cultivating sustainable management, which catalyzes teaching, research, and outreach initiatives, necessitates surmounting challenges rooted in the inform-engage-qualify-empower framework proposed by Cebrián (2016). Consequently, accurate and timely information must serve as the foundation for developing a communication infrastructure for sustainability-driven initiatives, aiming to involve individuals and groups in a participatory process. This will further facilitate the rise of sustainability-focused leadership, enrich the academic curriculum, and direct resources to pivotal projects within the institution.

## 8. Final Considerations

By employing the I3E Model within the context of a qualitative case study conducted at a Brazilian federal university, a member of the UI GreenMetric World University Rankings, this research provides insights into the organizational learning process linked to the evolution of a sustainable university. This analysis spanned across various domains, including management, teaching, research, and outreach. Thus, supported by the approaches of sustainability transition and organizational learning, it was possible to delve into the realities more comprehensively, discerning existing potentials and challenges and highlighting that sustainability, when emanating from management, holds greater potential to advance its learning process, revealing facilitators as tools to counteract inhibitors.

Within this analytical framework, this study demonstrated that the path pursued by the HEI mirrors the narratives presented in the extant literature (Cebrián, 2016, 2020; Lotz-Sisitka et al., 2015; Ruiz-Mallén & Heras, 2019). As in numerous other institutions, the HEI faces analogous hurdles in its pursuit of sustainability, and particularly in the case of HEI-1, the understanding of sustainability remains in its formative stages. There is an evident lack of a unified understanding, underscoring the urgency to cultivate an organizational culture rooted in sustainable values and principles.

As for this study's limitations, despite seeking to provide an exhaustive exploration of the chosen context, certain facets inevitably remained unaddressed. The limited number of published studies centered on the I3E Model curtailed an in-depth examination of the model's four elements (inform, engage, qualify, empower) in the context of sustainable management. As for future research directions, analyzing the I3E Model through transformative learning might be beneficial, given their shared foundation in holistic sustainability. Another intriguing avenue could be exploring political dynamics within institutions, especially understanding the repercussions of political disagreements and vested interests. Lastly, researchers could also consider studies focused on integrating outreach into the curriculum, which may potentially foster greater institutional unity and bolster a distinctive approach to education.

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