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Strategic leadership and dynamic capabilities in resource transformation: A case study of a sustainability-focused educational unit at a triple crown accredited institution in Germany

Liderazgo estratégico y capacidades dinámicas en la transformación de recursos: un estudio de caso de una unidad educativa centrada en la sostenibilidad en una institución alemana con triple acreditación

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ABSTRACT

This paper investigates the dynamics of capabilities in a resource transformation process by a sustainability-oriented educational unit, in a triple-accredited business school, achieving its mission through providing diverse educational courses, online courses, on-campus trainings, customized executive education programs, and professional expert track certificates, especially for international students. Based on Teece et al.'s (1997) dynamic capabilities framework, we pinpoint the three capability stages that are active in the unit: sensing, seizing, and transforming. By using a qualitative, exploratory case study with semi-structured interviews of three managers at senior, middle, and junior hierarchical levels, we illustrate how the unit uses its dynamic capabilities to

adapt to changing stakeholder needs, create innovative curricula, and generate value for students and institutional partners. Findings are intentionally bounded by this exploratory, three-informant design and are presented as illustrative rather than statistically generalizable. The research identifies a critical sensing gap, whereby signals collected at lower levels are not systematically captured or converted into strategic action by top management and proposes a "dynamic capabilities pipeline" as a practical contribution for other sustainability-oriented higher education institutions.

Keywords. Dynamic capabilities, resource transformation, resource-based view, professional education, case study, organizational capabilities, strategic management.

RESUMEN

Este artículo investiga la dinámica de las capacidades en un proceso de transformación de recursos por parte de una unidad educativa orientada a la sostenibilidad, en una escuela de negocios con triple acreditación, que logra su misión mediante la oferta de diversos cursos educativos, cursos en línea, formaciones presenciales, programas de formación ejecutiva personalizados y certificados de especialización profesional, especialmente para estudiantes internacionales. Basándonos en el marco de capacidades dinámicas de Teece et al. (1997), identificamos las tres etapas de capacidad que están activas en la unidad: detección, aprovechamiento y transformación. Mediante un estudio de caso cualitativo y exploratorio con entrevistas semiestructuradas a tres directivos de niveles jerárquicos superior, medio e inferior, ilustramos cómo la unidad utiliza sus capacidades dinámicas para adaptarse a las necesidades cambiantes de las partes interesadas, crear planes de estudio innovadores y generar valor para los estudiantes y los socios institucionales. Los resultados están deliberadamente limitados por este diseño exploratorio con tres informantes y se presentan a modo ilustrativo, más que como estadísticamente generalizables. La investigación identifica una brecha crítica en la percepción, por la que las señales recogidas en los niveles inferiores no son captadas sistemáticamente ni convertidas en acciones estratégicas por la alta dirección, y propone una «cadena de capacidades dinámicas» como contribución práctica para otras instituciones de educación superior orientadas a la sostenibilidad.

Palabras clave. *Capacidades dinámicas, transformación de recursos, perspectiva basada en los recursos, formación profesional, estudio de caso, capacidades organizativas, gestión estratégica.*

INTRODUCTION

Background and motivation of the study

Time has come when there is no option but to address climate change, resource scarcity, and social inequities. Universities have thus taken the lead in sustainability and integrated the related issues into their curricula, agendas for research, and outreach plans. The concept of sustainability has thus become a baseline across the board for universities that want to stay relevant and get funded in Europe (Lozano, 2015). The main reason for this is that the European Commission's European Green Deal along with the UN Sustainable Development Goals (SDGs) has become part of the standards for the universities and business schools (Nordensvärd et al., 2025). Consequently, there has been a rise in the provision of sustainability tracks, certificates, and educational modules in business schools (Cortese, 2003; Barth et al., 2007). The shift towards sustainability in education is quite visible (Leal Filho et al., 2025). However, institutions need to keep on spotting trends, taking advantage, and changing the resources that go hand in hand with the rapidly transforming external environment. The traditional resource allocation models which are static, meaning that the budgets, faculty, and course portfolios are predetermined on an annual

basis, often slow down the institutions in the face of new regulations, technological innovations, and changing customer expectations (Teece et al., 1997).

Dynamic capabilities theory provides a means of conceptualizing how organizations can get rid of this inertia. According to Teece et al. (1997), the trio sensing, seizing, and transforming forms a higher-order capability which allows the firms to reconfigure their resources quicker than others. Research on-profit industries substantiated the claim of dynamic capabilities in winning firms' performance, especially in the case of tumultuous market conditions (Helfat & Peteraf, 2009; Eisenhardt & Martin, 2000). Nevertheless, there is hardly any research on dynamic capabilities in non-profit or purpose-driven educational units, with most studies being about traditional corporate contexts (Barney, 1991; Pavlou & El Sawy, 2011). The educational unit with sustainability in focus (Leal Filho et al., 2025), which is a part of this study and operates within a triple crown-accredited business school, is delivering a portfolio of online MOOCs to executive programs for international learners. It is, in fact, a good match to look into this gap since the unit works under three simultaneous pressures:

1. Strategic Pressure: According to Freeman (1984), the program mix must not only fit the SDGs but also meet the needs of corporate partners, accreditation bodies, and future students.
2. Resource Pressure: The pool of resources includes a very specialized faculty, digital learning infrastructure that is expanding, and a network of industry advisors that is extensive. It is important to keep the VRIN (valuable, rare, inimitable, non-substitutable) quality of these assets for the sustained competitive advantage (Barney, 1991; Talaja, 2012).
3. Organizational Pressure: The unit is nested in a fully accredited institution (AACSB, EQUIS, AMBA, the so-called triple crown), which requires the university to go through a rigorous quality assurance process and to provide evidence for the impact of its sustainability initiatives (Barney & Clark, 2007).

These demands force the institution through a paradoxical situation where on one hand they have to be constantly innovative (seize) and on the other they have to keep the academic standards (transform) at the same level. Top management revealed that while the staff of lower and middle rank have a habit of going to conferences, keeping an eye on what rivals do, and selecting external educational resources, the top management has no systematic, documented way of getting those signals and making them into new curriculum or changes in the organization concretely. This has been observed not only in this particular case, but also in many others as described by Eisenhardt & Martin, who pointed out that the management of sensing is very good in a lot of organizations, but they still fail to make the transition from seizing to transforming (Eisenhardt & Martin, 2000).

Taking into account the strategic necessity of sustainability education and the limited availability of academic literature on dynamic capabilities in educational institutions, the current research aims to achieve three interrelated goals:

- On the theoretical side, to develop the dynamic capabilities and resource-based view (RBV) frameworks further into a non-profit, mission-driven educational context.
- On the empirical side, to illustrate how the educational unit is currently performing at each of the three dynamic capability stages (sensing, seizing, transforming) and to pinpoint the gaps.
- On the practical side, to formulate concrete recommendations that help the unit make a "sensing-seizing-transforming pipeline" part of its routines, thus increasing its agility, resource utilization, and long-term impact in the area of sustainability education.

In short, the case study tries to show how a top-notch sustainability-centered educational unit can empower itself with dynamic capabilities so as to keep on altering its resource base continuously, thus providing parallels that can be drawn with other higher education institutions having to comply with the same sustainability-oriented imperatives.

Research question

How does a sustainability-focused educational unit at a triple crown accredited business school leverage its dynamic capabilities to transform its resource base?

The question is intentionally designed to reflect the three classic stages of the dynamic capability theory, which are sensing, seizing, and transforming (Teece et al., 1997), and at the same time, it highlights the RBV (resource-based view) issue that a firm should constantly adjust its valuable, rare, inimitable, and non-substitutable (VRIN) resources in order to maintain its competitive advantage (Barney, 1991; Talaja, 2012).

Research objectives

Table 1. Research objectives

	OBJECTIVE	THEORETICAL RATIONALE & EXPECTED CONTRIBUTION
RO1	Analyze the unit's dynamic capability repertoire (sensing, seizing, transforming) and map how each capability is exercised in day-to-day operations.	Directly tests Teece et al.'s (1997) three-stage model in a non-profit, purpose-driven educational context, addressing the "micro-foundations" gap highlighted by Helfat and Peteraf (2009).
RO2	Identify and categorize the unit's resource portfolio (knowledge assets, pedagogical expertise, digital infrastructure, networking relationships, and human capital capabilities).	Provides the empirical substrate for evaluating whether resources satisfy VRIN criteria (Barney, 1991) and clarifies which assets are most critical for sustainability-focused education (Wiek et al., 2011).
RO3	Examine the processes and mechanisms that link sensing to seizing and seizing to transforming (e.g., governance routines, knowledge management systems, cross-functional innovation labs, and budgeting cycles).	Bridges the three dynamic capability stages, responding to the criticism that many organizations possess strong sensing but weak seizing-to-transforming pathways (Eisenhardt & Martin, 2000).
RO4	Evaluate the impact of the transformed resource base on strategic agility and competitive advantage (e.g., program relevance, stakeholder satisfaction, accreditation performance, contribution to the UN SDGs).	Connects resource reconfiguration to measurable performance outcomes, allowing the study to speak to both strategic management theory (RBV) and practical sustainability metrics (Freeman, 1984).
RO5	Diagnose gaps and bottlenecks in the current dynamic capability system (e.g., missing formal horizon-scanning tools, insufficient cross-level communication, limited budgetary flexibility).	Extends the literature on capability gaps in higher education institutions (Pavlou & El Sawy, 2011) and provides a diagnostic framework that can be reused by other units.
RO6	Develop evidence-based recommendations for strengthening dynamic capabilities and further transforming key resources (e.g., institutionalizing a "sensing-seizing-transforming pipeline," creating a centralized knowledge repository, establishing innovation incubators).	Offers actionable guidance that can be operationalized by senior leadership, thereby closing the loop between theory and practice and contributing to the emerging body of work on dynamic capabilities in non-profit education (Helfat & Peteraf, 2009).
RO7	Propose specific actions or strategies for enhancing adaptability and seizing emergent opportunities based on the interview data (e.g., regular horizon-scanning workshops, cross-departmental pilot projects, agile budgeting mechanisms).	Aligns with the study's overarching aim to improve the unit's market position and impact, echoing calls for strategic agility in sustainability education (Lozano, 2015).

The Interrelationship of Objectives The series of seven research objectives illustrate a clear path from description through diagnosis to prescription:

1. RO1 and RO2 work together to establish the baseline by mapping the capabilities of the existing resource portfolio to be identified.
2. RO3 presents the linkage mechanisms that turn the environmental signals into organizational actions and consequently, the dynamic capability stages are shown to be interconnected in practice.
3. RO4 takes the linkages' outcomes and decides whether the changed resource base actually contributes to the improvement of strategic agility and the development of the competitive position.
4. RO5 points out the weak areas in the capability chain thus providing the diagnostic insights needed for improvement that is directed and targeted.
5. RO6 and RO7 are the steps where the diagnostic findings are converted into practical interventions thereby guaranteeing that the research not only goes through the description phase but also provides the prescriptive guidance for the organizational enhancement.

Contributions and paper structure

This study makes three interconnected contributions. Theoretically, it extends the dynamic capabilities framework (Teece et al., 1997) and the Resource-Based View (Barney, 1991) into a non-profit, purpose-driven educational context—a domain that has received limited attention in the strategic management literature (Ambrosini & Bowman, 2009). Methodologically, it demonstrates how qualitative, multi-level interviews across hierarchical strata can be systematically linked to macro-level strategic constructs such as VRIN criteria and SDG alignment, offering a replicable design for analogous investigations. Practically, it proposes a "dynamic capabilities pipeline" to help the unit and similar higher education institutions institutionalize the sensing–seizing–transforming sequence, thereby strengthening their strategic agility and long-term sustainability impact. Readers should note that, given the exploratory, single-case design with three informants, all findings are presented as illustrative rather than statistically generalizable; they are best understood as a springboard for future multi-case and longitudinal research.

The remainder of the paper is organized as follows. The Literature Review situates the study within the RBV and dynamic capabilities scholarship, as well as the sustainability-in-education literature. The Research Methodology section details the qualitative case study design, purposive sampling rationale, interview protocol, and thematic analysis procedure. The Findings and Discussion section presents results organized around the three dynamic capability stages. The Conclusion synthesizes the key contributions, foregrounds the critical sensing gap as the study's primary finding, and proposes directions for future research.

LITERATURE REVIEW

Sustainable development and education

Sustainable development is now regarded as an indispensable part of education meant for the present and future, especially in the field of business and management. Educational institutions are expected to train future leaders who are capable of approaching global challenges, such as climate change and biodiversity loss along with social inequality and resource scarcity, in a systematic and holistic way (Cortese, 2003). Alongside this trend, academia is being actively engaged in developing and proposing future-oriented practices as a major source of change in the entire industry and society (Lozano, 2015; Wiek et al., 2011). Leading business schools have opened up new avenues of cooperation with sustainability-oriented departments through the establishment of sustainability as a core value in their programs, pedagogies, partnerships, and institutional functioning (Urbano et al., 2025).

The imperative for sustainability in business education

The integration of sustainability in business education is a response to a number of converging pressures. The first one is that the regulatory frameworks like the European Union's Green Deal and the UN's SDGs, among others, have pointed out the institutions of education as players that must contribute to the sustainability transitions very explicitly (Lozano, 2015). The second one is that different corporate stakeholders seek graduates who are sustainability literate and can handle the complexities of environmental, social, and governance (ESG) considerations very well in the context of making strategic decisions (Wiek et al., 2011). The third point is that students are the ones who have the most to say in these transformations, as they are the ones most vocal about their needs for sustainability-related skills, which they perceive as crucial for being up-to-date in their careers and in harmony with their personal values (Barth et al., 2007).

Educational units with a sustainability focus have as their main objective the creation of sustainable leaders through transformative teaching. To this end, the unit has to regularly revamp their resources, learning techniques, and course structures everything to make them relevant to the current sustainability issues and to the changing requirements of the various groups of stakeholders (Cortese, 2003). This ability of the organization to adapt can be seen as a reflection of the term 'dynamic capabilities', which is defined as "a firm's ability to integrate, build, and reconfigure internal and external competencies to the rapidly changing environments" (Teece et al., 1997).

The role of multi-stakeholder partnerships

The "Triple Crown" of business accreditation, AACSB, EQUIS, and AMBA, characterizes the highest quality in management education, less than 1% of business schools having it globally (OBE, 2025). These entities have recently made a radical change by turning the sustainability criterion into a mandatory requirement for accreditation instead of an optional specialization. For example, the AACSB's 2020 accreditation standards for business now require schools to show positive "societal impact" consistent with macro-level global issues, while EQUIS has made "Ethics, Responsibility, and Sustainability" (ERS) a standard that is supposed to be seen in every operation of a school, from research through faculty to campus management, to the latter (EFMD, 2024; AACSB, 2020).

As a result, the Triple Crown institutions have to rethink their curricula and shift the focus from the traditional approach of serving only the interests of the shareholders to that of considering all

stakeholders based on the UN Sustainable Development Goals (SDGs). It is found that the pressure from the accreditors is one of the major reasons for business schools to integrate ESG (Environmental, Social, and Governance) principles into the core coursework rather than treating them as side topics (Elliott, 2013). This connection not only ensures that the accredited programs are producing graduates who are financially literate but also that they are following the UN Principles for Responsible Management Education (PRME), thus empowering the future leaders with the necessary skills to handle climate and social justice issues (UN PRME, 2023).

The resource-based view: Foundations of competitive advantage VRIN framework

The Resource-Based View is a primary viewpoint that shows organizations' control over valuable, rare, inimitable, and non-substitutable (VRIN) resources as the main reason for their competitiveness and sustainability (Barney, 1991; Wernerfelt, 1984). This overview takes the strategic view from the outside world to inside companies and states that the diversity of resource distribution among firms explains the lasting difference in performance (Barney, 1991). Resources are the combination of tangible assets and intangible assets such as physical infrastructure, financial capital, human capital, organizational processes, information systems, and relational networks (Barney & Clark, 2007). Schools and colleges would find faculties, institutional reputation, alumni networks, digital learning platforms, research capabilities, and accreditation status among the resources that they cannot do without (Grant, 1996, 2013).

- The VRIN framework proposed by Barney (1991) offers a systematic approach to deciding which resources can provide a company with a long-lasting competitive edge:
- Value: Resources have to allow the company to take advantage of or neutralize the threats in its environment, thus adding to the effectiveness or efficiency
- Rarity: Resources have to be limited among the present and future competitors, not easily available in the factor markets
- Inimitability: Resources have to be so different from others that it becomes impossible for the competitors to copy them because of the distinctive historical conditions, causal ambiguity, or social complexity
- Non-substitutability: Resources have to be the only ones that have no equivalents in terms of strategy and that the competitors would not use to reach the same effects.

For sustainability-oriented teaching modules, the VRIN resources might consist of professors with interdisciplinary expertise that is not easily found in other institutions, combining sustainability science with business areas, unique cooperation with corporations or NGOs that are sustainability-oriented using the exclusive ones, and among them the original curricula integrating systems thinking with applied management knowledge or the proprietary teaching methods that have been developed through years of trial and error refining (Talaja, 2012). When these resources are properly organized and put in practice using proper organizational routines, they not only enhance the institution's reputation, but also the students' results and the community's impact.

Dynamic capabilities: Organizational adaptation and renewal

The dynamic capabilities theory was developed somewhat to overcome the restrictions of the static RBV analysis by concentrating on the differentiating factor namely how the organizations change their resource bases in the changing environments. It is worth acknowledging, however, that the RBV has itself evolved in response to this critique: scholars such as Eisenhardt and Martin (2000) and Ambrosini and Bowman (2009) have proposed a "Dynamic RBV" that embeds resource

reconfiguration directly into the resource-based logic, treating the capacity to change one's resource base as itself a higher-order resource. This paper adopts the complementary view in which the classic VRIN framework (Barney, 1991) and the dynamic capabilities model (Teece et al., 1997) are analytically distinct but theoretically mutually reinforcing. One of the central proponents of the theory, Teece et al. (1997), stated that dynamic capabilities are "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (p. 516). Through this perspective, not only resource possession was emphasized, but it was the whole process of the organization through which resources were reconfigured, such as the routines and the managerial cognition that enabled resource reconfiguration. Teece (2007, 2014) presents a three-stage framework to explain dynamic capabilities:

1. Sensing: Discovering and evaluating opportunities and threats through scanning, searching, and exploring activities of all kinds across technologies, markets, and customer needs
2. Seizing: Organizing and evaluating resources to extract value from sensed opportunities through strategic decision-making, resource allocation, and organizational commitment
3. Transforming: Reconfiguring organizational assets, structures, and routines to remain aligned with changing environments and to avoid organizational inertia and path dependencies

Educational institutions that use dynamic capabilities are in a better position to foresee changes in sustainability preferences, like the increasing significance of the integration of ESG (Environmental, Social, and Governance) criteria in business school courses, climate-related regulations coming up, and the changes in students and employers' expectations, and to move teaching talent, technology, or industry bonds around as needed (Teece, 2014).

Dynamic capabilities refer to capabilities of a higher order that control the ordinary ones (the daily operational routines that normally allow current functions). While ordinary capabilities make it possible for an organization to execute its activities very well, dynamic capabilities are the ones that direct changes in the activities over the years (Helfat & Peteraf, 2009). For an educational unit, ordinary capabilities might cover course delivery, student assessment, or program administration, and dynamic capabilities would include curriculum redesign processes, partnership development mechanisms, or pedagogical innovation routines.

Integrating RBV and dynamic capabilities

The RBV and dynamic capabilities interplay is a key factor when it comes to long-term organizational adaptation and survival. On the one hand, the traditional RBV theory advocates for an organization to locate its VRIN resources and thus gain a strategic advantage, meanwhile the dynamic capabilities theory grants organizations the power of being able to evolve and reinvent their resource base in reaction to changing environmental conditions (Teece et al., 1997; Ambrosini & Bowman, 2009).

The combination of these two approaches solves a critical strategic dilemma: organizations need to, at the same time, make use of their current resources in order to gain a competitive advantage and to explore new resource arrangements for their future adaptation (March, 1991). Educational institutions are in this situation quite strongly, they need to provide a good quality education by using the same professors, curricula, and teaching methods while at the same time they are developing new skills, partnerships, and offerings to keep their relevance.

Application to educational contexts

The RBV and dynamic capabilities frameworks, although originally designed for profit-making companies, are still applicable to the educational sector but with modifications to the context. Distinctive factors that characterize educational organizations are as follows:

- Mission orientation: Educational units not only aim at learning outcomes and societal impact but also at gaining competitive positioning, thus creating multi-objective optimization challenges.
- Stakeholder complexity: The expectations of different stakeholders (students, faculty, employers, accreditation bodies, funding agencies) that might even be conflicting are the ones that educational institutions deal with (Freeman, 1984)
- Institutional embeddedness: Educational units usually work within bigger institutional frameworks that limit their independence but provide them with resources and credibility
- Knowledge intensiveness: The main resources of educational organizations are hard to measure, thus making the VRIN assessment and capability development particularly cumbersome.

THEORETICAL FRAMEWORK AND SYNTHESIS

Integrating dynamic capabilities and resource-based view

This particular piece of research is based on the foundation of a dual-theoretical perspective, which combines the Dynamic Capabilities (DC) and the Resource-Based View (RBV) theories. Through this combination, the study will take a look at sustainability-centered educational unit and how they strategically develop, deploy and reconfigure their resources in a way that they not only fulfill their mission but also sustain a competitive edge. The combination tackles the combined strengths and weaknesses of the two frameworks, and as a result, a more thorough analytical tool is provided than either view could have given on its own.

The Resource-Based View claims that an institution's long-lasting success is determined by how well it can acquire, develop and make use of its strategic resources. Barney (1991) and Wernerfelt (1984) pointed out that resources which are valuable, rare, inimitable, and non-substitutable (VRIN) constitute the base of competitive advantage that is gained and maintained. In the case of educational institutions, the resources include both physical and non-physical assets, such as faculty expertise, institutional reputation, stakeholder networks, technological infrastructure, research capabilities, pedagogical innovations, and specialized knowledge domains (Grant, 1996).

The RBV (Resource-Based View) framework addresses the issue of what unique resources provide the companies with an advantage over their competitors. For example, in the case of sustainability-focused educational unit, it means determining those organizations' assets that generate the strategic differentiation as well as the barriers to imitation like multidisciplinary faculty knowledge, joint active cooperation with the industry, new curriculums, or the most prestigious academic accreditation (triple crown). The RBV, however, is essentially a static view and therefore gives limited advice on how organizations should change their resource configurations in dynamic environments (Teece et al., 1997).

Dynamic Capabilities theory which was originally developed by Teece et al. (1997) offers a solution to this limitation by concentrating on the firm's ability to integrate, build, and reconfigure internal and external competencies to deal with rapidly changing environments (p. 516). According

to this view, dynamic capabilities are the top-level capabilities that allow companies to not only survive the ups and downs of the market but also to continuously innovate and to realign their operational capacities with their strategic goals (Helfat & Peteraf, 2009).

The DC framework provides an answer to the question of how organizations are able to adapt their resource bases on continuous basis. While the framework is applied to the case of sustainability education, it can be said that the process of modernization of the educational unit's teaching methods, adding new and deleting old subjects, changes in partnerships and resources can be explained through the lens of evolving sustainability, stakeholders' and competition (Ambrosini & Bowman, 2009).

Theoretical integration and research application

The present research, using the combination of these different theoretical approaches, considers the unit of education, which are focused on sustainability, not only as resources with unique characteristics but also as institution that are adaptive and learning-oriented and, thus, capable of modulating their resource bases according to the specific needs of sustainability education. The integration occurs on several analytical levels:

- Strategic Level: The RBV lines up which resources create the competitive edge and the dynamic capability explains how these resources are gradually and constantly developed, secured or reconfigured so that their strategic relevance is not lost.
- Operational Level: The RBV lays down the guidelines for resource appraisal (VRIN) whereas the Dynamic Capability Theory reveals the organizational processes and managerial mindset that are necessary for the conversion of resources into capabilities and subsequently, to the outcomes of performance.
- Temporal Dimension: The RBV provides a cross-sectional analysis of the resource-advantage relationships while the DC gives a longitudinal understanding of the resources' evolution and the organizations' adaptation over time.

RESEARCH METHODOLOGY

Justification for qualitative methodology

There are numerous entwined reasons as to why a qualitative methodology has been chosen for this research. Firstly, qualitative methods allow for a thorough exploration of social and organizational phenomena from the point of view of the people involved (Yin, 2018). The research is interested in the very subtle ways of how dynamic capabilities are enacted that, among others, include management cognition and organizational routines, and informal practices, human nature, thus, qualitative methods will facilitate the access to the interpretive and experiential aspects while quantitative approaches would only block them. Second, in order to reveal the meanings and interpretations attached to the practices by the organizational actors through the use of qualitative designs, thus making such approaches especially fitting for studies on strategic behavior and decision-making within certain organizational contexts (Tufa & Kant, 2023).Taking into consideration that dynamic capabilities consist of intricate and often unspoken organizational processes, the means of penetrating into Top Management (TM) sensemaking and strategic reasoning is the qualitative interviews' depth and flexibility. Third, the exploratory character of this research that is going to extend dynamic capabilities and RBV to an undersized area of the study (i.e. non-profit sustainability education) is completely getting along with qualitative methodology's

theory-building power. Instead of confirming the pre-specified hypotheses, the researchers intend to produce a contextualized understanding that would not only permit theoretical refinement but also yield propositions for further research (Eisenhardt & Graebner, 2007) thus making one more round in the research circle.

Case study design

The study uses a case study design based on a single case that looks at the specific instance of strategic processes within a sustainability-focused educational unit at an institution that is triple crown accredited. Case study methodology is especially suitable when the research questions are about the present phenomena and the real-world contexts where the phenomena are located, particularly when the boundaries between the phenomenon and context are not very clear (Yin, 2018). One of the advantages of case study research is the ability to a thorough investigation of the factors related to the context, the operations inside the organization, and the mutual influences of the different actors working in the organization that lead to the strategic transformation of resources. It allows for a whole process analysis that is very complex, as compared to isolating variables in artificial settings (Eisenhardt & Graebner, 2007). The approach also enhances theory development by anchoring empirical insights within the theoretical frameworks of Dynamic Capabilities and Resource-Based View, thereby testing their explanatory power in educational settings and at the same time pinpointing necessary theoretical modifications. The choice of this particular case is based on both substantial and theoretical reasons. Substantially, the unit is one that is recognized for its sustainability education, and it is also within a very reputable institutional context, which means it is a very informative case that is likely to provide significant insights (Patton, 2015). Theoretically, the unit's triple crown accreditation, sustainability specialization (Leal Filho et al., 2025), and diversified program portfolio create conditions under which dynamic capabilities should be very clear, allowing for a very good observation of the theoretical concepts that are of interest.

Data collection strategy

The primary data for this study came from semi-structured interviews with the management staff at different hierarchical levels in the unit. On the one hand, the systematic analysis and also the exploration of emergent themes and flexibility of the inquiry process are enabled by semi-structured interviewing (Bryman, 2016).

Sampling strategy

Purposive sampling was employed to select informants who collectively represent the full strategic decision-making hierarchy of the unit. The rationale for this strategy rests on three grounds. First, qualitative exploratory research prioritizes depth and informational richness over statistical representativeness; purposive sampling is specifically designed to maximize the relevance of each participant to the research questions (Patton, 2015). Second, the unit under study is a small, specialized educational division whose strategic leadership comprises exactly three hierarchical tiers: the senior leader responsible for external strategy, the middle manager responsible for program development and resource coordination, and the junior manager responsible for day-to-day implementation. Interviewing one representative from each tier therefore constitutes a census of the strategic core of the unit rather than a subset of a larger population. Third, triangulating perspectives across hierarchical levels is recognized as a methodological strength in qualitative organizational research, as it can surface alignment or misalignment between

strategic intent and operational reality, a distinction of particular theoretical relevance to the sensing–seizing–transforming model (Eisenhardt & Martin, 2000). While the three-informant design is acknowledged as a limitation of external validity, it is appropriate and sufficient for the exploratory, theory-building purpose of this study, and is consistent with the scale of similar qualitative capability studies in specialized organizational units (Yin, 2018).

Three managers were interviewed, each representing a different hierarchical level within the unit:

1. Senior Manager: Responsible for the unit's strategic direction, external partnerships, and overall positioning.
2. Middle Manager: Involved in development of programs, allocation of resources, and cross-departmental cooperation.
3. Junior Manager: Worked in implementing operations, interacting with students, and running programs on a daily basis.

The structure of this hierarchical system made it possible to collect and reflect a variety of viewpoints on how the strategic decisions are made, communicated, and implemented and, finally, how they are felt throughout the organization. The diversity in managerial roles allowed the exploration of how dynamic capabilities are distributed among different levels of the organization, thus capturing the possible misalignment between strategic intent and operational reality, a significant aspect in the literature's concern over the capability gap between sensing and transforming (Eisenhardt & Martin, 2000).

Interview protocol

The interviews took the form of discussions centered on major topics derived from the dynamic capability framework, particularly emphasizing the unit's capability of sensing, seizing, and transforming with respect to external change and internal opportunities. Even though the interviews were based on pre-constructed questions related to the theoretical framework, the semi-structured format permitted the use of probing follow-up questions and the discovery of unanticipated themes from participants' responses. Each interview lasted approximately 45 to 60 minutes and was conducted in-person during a four-week period in the spring semester. With the informed consent of all participants, interviews were audio-recorded and subsequently transcribed verbatim. Transcripts were reviewed for accuracy against the recordings prior to analysis. To minimize potential social desirability bias, interviewees were explicitly informed that the research aimed to understand organizational processes rather than evaluate individual performance, and that their responses would be anonymized in all reporting.

The interview protocol was organized into the following thematic domains:

Sensing Capabilities

1. How do you monitor and analyze the external environment for potential threats and opportunities relevant to the unit?
2. How is information about external trends communicated and shared within and across different functional areas of the unit?

Seizing and Learning Mechanisms

3. How do you mobilize and allocate resources to implement actions identified as strategically important?
4. How do you learn from the outcomes of your actions and incorporate feedback into your routines, processes, or future decisions?

Transforming and Innovation

5. How do you foster a culture of innovation and experimentation within the unit?
6. How do you cope with uncertainty and ambiguity when making strategic decisions?

The purpose of these questions was to investigate the process of managers' perception of the changes in the environment, the making of strategic choices for the corresponding action, and the organization's capabilities' restructuring to keep or boost the performance in the face of complexity and uncertainty. The protocol intentionally kept away from technical jargon (for instance, "dynamic capabilities") so that it would not put off the managers' speaking easily and naturally about the organizational practices.

Alignment with research objectives

The study, through its qualitative and exploratory method, succeeded in portraying both the strategic intent and the practical realities of the dynamic capabilities' deployment within the unit, thus showing how the strategic resources were modified for the sake of sustainability and competitive differentiation. This particular design not only provided answers to the research questions but also facilitated the deeper objective of connecting the conceptual theory (Dynamic Capabilities and RBV) with empirical evidence thereby granting valuable contributions to both the strategic management focus and the sustainability education practice at large. The methodology's main advantages are:

- Complexity capture: The revealing of the multifaceted and interconnected organizational capabilities
- Access to interpretation: Grasping the perception of the organizational actors regarding their strategic environment and choices
- Contextualization enablement: Placement of capability deployment in particular institutional and field contexts
- Theory building support: Providing insights that could refine and enlarge the existing theoretical frameworks

Data analysis methods

The thematic analysis method was used to analyze the qualitative data obtained from the interviews, following the six-phase framework of Braun and Clarke (2006): data familiarization, initial code generation, theme search, theme review, theme definition and naming, and final write-up. Thematic analysis was selected for its adaptability and its capacity to produce rich, systematic descriptions of participants' lived experiences in organizational contexts (Ahmed et al., 2025). Several methodological decisions warrant explicit clarification.

First, the thematic structure was primarily theory-guided (a priori), with the three dynamic capability stages: sensing, seizing, and transforming, serving as organizing categories derived from Teece et al. (1997). Within these a priori categories, coding was carried out inductively to allow emergent sub-themes to surface from the data without being forced into pre-determined slots. This hybrid approach is appropriate when an established theoretical framework is being tested in a new empirical context (Fereday & Muir-Cochrane, 2006). Second, the interviews were conducted and transcribed verbatim by the primary researcher. Transcription was completed within 48 hours of each interview to minimize recall bias. The data collection period spanned four weeks, and each interview lasted approximately 45 to 60 minutes. Third, no dedicated qualitative data analysis

software was used; instead, data were managed manually through annotated printouts, colour-coded margin notes, and a thematic matrix that mapped coded excerpts to the six interview questions and the three DC stages. This approach is consistent with the small dataset size and the interpretive, close-reading nature of the analysis. Fourth, regarding validity and reliability, the study acknowledges that a single coder was involved, which limits inter-rater reliability checks. To partially compensate, reflexive memoing was maintained throughout analysis to make the researcher's interpretive decisions transparent, and member-checking was conducted informally by sharing summary findings with participants. Fifth, concerning ethical considerations, all participants were informed of the study's purpose, assured of anonymity, and provided verbal consent to participate and to have the interviews recorded; no personally identifying information appears in the findings.

FINDINGS AND DISCUSSION

Interviews across three hierarchical levels revealed both convergences and divergences in how the unit enacts its dynamic capabilities. The findings are organized around the three DC stages: sensing, seizing, and transforming, thus, reflecting the theory-guided thematic structure described in the methodology. Table 1 provides an overview of the key finding per capability stage and interview question; detailed discussion follows.

Table 1. Summary of key findings by dynamic capability stage

DC STAGE	INTERVIEW QUESTIONS	KEY FINDING
SENSING	Q1: Monitoring the environment	All three levels actively scan the environment (conferences, publications, competitor analysis), but no systematic process exists to document and escalate these signals to top management. Hence, showing a critical sensing gap.
	Q2: Information sharing	Senior management communicates broadly and informally; junior management relies on formal meetings and official channels. Hierarchical differentiation creates "knowledge boundaries" that impede cross-level knowledge flow.
SEIZING	Q3: Resource mobilization	Top management focuses on strategic hiring and capability building; junior management focuses on task allocation and using existing tools. Organizational ambidexterity is present but coordination across levels is sometimes delayed.
	Q4: Learning from outcomes	All levels engage in feedback-seeking and post-activity reflection; however, learning loops are informal and not systematically codified into organizational routines.
TRANSFORMING	Q5: Innovation culture	Top management drives large-scale strategic innovation; junior management operationalizes it. Diversity and collaborative communication are recognized as enablers across levels.
	Q6: Managing uncertainty	Top management relies on experience-based intuition; middle and junior management prefer structured research and consultation. A "certainty gap" across levels requires bridging through scenario planning and structured dialogue.

Sensing capabilities

How do you monitor and analyze the external environment for potential threats and opportunities?

The evaluation of the feedback about the first question highlights the scouting of the organization's environment and thus confirms Choo (1999) who puts it among the best practices necessary for an organization to get adapted and not only survive but also thrive. The management at all three levels agreed on the first question that the attending of conferences and networking events to learn about emerging trends, develop ideas, and make connections is indeed the most significant way to be always informed. This finding is in line with Daft and Weick's (1984) statement that the active organization must use multiple channels to get the environment sensing and become aware of changes and opportunities. The focus on conferences and networking illustrates what Nonaka and Takeuchi (1995) call the socialization mode of knowledge creation where tacit knowledge is communicated through face-to-face meetings and shared experiences.

Moreover, all the interviewees pointed out the perusal of reference materials as well as the use of audiovisual materials, online courses, and competitors' activities analysis. This combination of different methods in environmental scanning corresponds with Aguilar's (1967) environmental scanning modes whereby one has both formal and informal information gathering methods. The fact that all levels of management consistently used these resources suggests what Day and Schoemaker (2006) refer to as "peripheral vision" which is the ability of an organization to pick up weak signals from the environment. Getting to the point of staying up to date, this aspect demands taking and honing the information sources that are relevant which is a process that March (1991) calls organizational learning and adaptation.

A significant difference highlighted in the data is that the lower level of management more heavily relies upon regular and internal meetings and discussions to detect problems and opportunities, which is aligned with Mintzberg's (1973) view that such communication is part of the informational role of the management at the operational levels. On the other hand, middle and higher management did not explicitly mention this as an important tool to receive feedback from all involved, thus potentially pointing to what Teece (2007) cautions as a danger of losing touch with the market information coming from the ground level. The different methods of collecting information according to the hierarchy reflect Floyd and Wooldridge's (1992) findings about the different strategic roles of middle management in the processes of sensing and sensemaking. It is quite surprising that the higher management mentions the absence of a regular process or tool for keeping themselves informed about the new tools and takes more of an informal approach by getting feedback from colleagues instead of inputs coming from the networking events. This remark is even more worrisome in light of Teece et al.'s (1997) assertion on the necessity of systematic sensing mechanisms as the basis of dynamic capabilities. Although relying on informal channels can be very useful for tacit knowledge transfer (Polanyi, 1966), it may lead to what Cohen and Levinthal (1990) label as limited absorptive capacity, the capability to identify, incorporate, and use new external knowledge. Nonetheless, both lower and middle management did not refer to this absence of systematization and considered formal and informal meetings as opportunities to share ideas and views on various matters related to their daily tasks and inputs. This contradiction hints at what Argyris and Schön (1978) call the possible organizational defensive routines that might obstruct the acknowledgment of systemic gaps in knowledge management processes.

Here we find an important gap that needs to be filled if the information coming from the inputs is to be properly secured and constantly updated, thus being able to pass across the unit and used

effectively in the future. This gap is what Hansen et al. (1999) identify in the need for both, codification and personalization of the knowledge management strategies. The lack of systematic procedures for getting and keeping environmental intelligence could result in what Huber (1991) calls "organizational forgetting," where organizations lose valuable insights simply because they do not have proper knowledge retention mechanisms in place. Besides, Grant (1996) suggests that organizations are not able to put in practice their knowledge-based resources for competitive advantage to the fullest extent, unless they have good knowledge integration mechanisms in place. The top management, although having the greatest strategic responsibility for environmental scanning (Hambrick, 1982), acknowledges that they have fewer systematic approaches than the lower levels, and this may be what could be referred to as a "sensing paradox." This might illustrate what Ocasio (1997) discusses as the weaknesses of the attention-based view, where the attention of top management is scattered over several competing priorities, which might in turn lead to a decrease in their sensing capabilities.

To sum up, lower and middle management are mainly concerned with learning and collecting data, whereas top management is mainly concerned with applying that data to the revision of programs, opportunity identification, and threat recognition and anticipation. This distribution of sensing activities across organizational levels corresponds to Burgelman's (1983) model of strategic behavior where different levels of the organization differently contribute to the formation of strategy. Yet all levels depend on the same sources such as conferences, events, and networking to be informed on changes, a fact that supports Granovetter's (1973) theory regarding the strength of weak ties in the access of new information. Still, the absence of systematic processes for knowledge capture and sharing is a major drawback of the organization's sensing proficiency, which could even compromise what Zollo and Winter (2002) terms as the deliberate learning mechanisms that are vital for constructing and sustaining dynamic capabilities. Improving this lacking area by implementing formal knowledge management systems while not cutting off the valuable informal channels could augment the organization's overall adaptive capacity (Eisenhardt & Martin, 2000).

How do you communicate and share information within and across different divisions and functions of unit?

The communication and information sharing channels vary between the three management levels, which is in line with Tushman and Nadler (1978) who defined information processing requirements of various organizational levels. The different communication styles between the levels match the media richness theory (Daft & Lengel, 1986), which argues that the selection of communication channels by managers is based on the complexity and uncertainty of the information that is being communicated. Specifically, top management prefers to use formal channels such as meetings and emails. Information sharing is regarded as a way to exchange experiences and ideas. The use of formal channels in top management paraphrases Mintzberg's (1973) remark that senior managers are the "nerve centers" of the organization's information flow which needs structured mechanisms for managing exchanges of complex information. The focus on sharing experience corresponds to what Dixon (2000) calls "collective learning," where the organizational knowledge is developed through the sharing of individual experiences and insights. In keeping with this, a great concern was raised about the unit's information exchange through informal sub-teams being too rigid, hence the emphasis on flexibility. The dual approach of maintaining formal structures while allowing informal flexibility is a situation that Brown and Duguid (1991) describe as being between canonical and non-canonical practices in organizational

learning. The formation of informal sub-teams is what Wenger (1998) sees as "communities of practice," where knowledge is transferred effortlessly by being involved with others who are doing the same thing.

This action is closely related to what the middle management pointed out since it employs the full range of communication techniques, both formal and informal ones. These techniques are: meetings, presentation-based training or inputs, emails, and informal chat. The use of this hybrid method is in accord with the characterization of middle managers by Floyd and Wooldridge (1997) as "linking pins" who have to deal with both the upward and the downward communication flows. The variety of communication channels used by middle management reflects their boundary-spanning function (Aldrich & Herker, 1977), which means they really have to work hard to translate and transmit information both forth and back between the strategic and operational level. What is more, the latter point brings out the importance of not just relying on informal chat but also making use of official channels. Such an approach is, indeed, a conscious and balanced one, and it supports Krackhardt and Hanson's (1993) argument for the necessity of using the formal organizational chart as well as the informal "company behind the chart" in order to achieve an optimal flow of communication within the organization.

On the other hand, the lower management is heavily reliant on formal structures such as wider department meetings, sub-team meetings, and internal communication channels for the communication of tasks. The use of formal communication structures at the operational levels is in line with Weber's (1947) bureaucratic theory, where the use of standardized communication channels assures both the consistency and accountability of the execution of the tasks. The use of formal channels for communication of tasks stresses what Galbraith (1973) points out as the need for prearranged information processing mechanisms when routine operational activities are carried out. On the contrary, this dependence on formal structures may inhibit the what Burt (2004) labels "structural holes", the chances for the exchange of novel information that usually occurs via informal networks.

In an effort to present the outcome in an understandable way, the higher-ups consider information sharing as a process of broadening the communication of experiences, thus showing the similarity with what Carlile (2004) posits as a method of knowledge movement among communicating parties, where information not only has to be passed on but also has to be modified according to different contexts. This viewpoint is congruent with the upper echelon's theory of Hambrick and Mason (1984), which claims that the top management has to be provided with a variety of information inputs in order to make the right strategic decisions. Nevertheless, the middle management mixes the formal and the informal channels, thus being what Nonaka (1994) calls the "middle-up-down" management model, where middle managers act as the vital connector between the high-management's visionary ideals and low-management's chaotic reality of operations. Still, the lower management prefers the use of the formal structures more and the applying of the collected information to solve particular issues in their part of management, which is consistent with Thompson's (1967) definition of technical rationality being at the operational core of organizations.

Hence, the further up the management pyramid one goes, the more the sharing and communication of information are through wide and open channels facilitating the flow of information and even more so from different units of the organization. The pattern of communication becomes as Lawrence and Lorsch (1967) call it the differentiation-integration challenge, where the companies at the top level have to and become more and more proficient in integrating the very diverse sources of information. The large-scale interactions that take place at the top level of an organization are in line with Ashby's (1956) law of requisite variety, which implies that the systems

of management should not only be as complex as their surrounding environment but also be able to cope with it. This is because the lower management is only communicating mainly the specific issues and decisions that are relevant to their teams and units, which is what Simon (1947) calls bounded rationality, because it gives the impression that the unit is focusing only on the nearby, local concerns and thus neglecting the broader organization-wide issues.

Nevertheless, team meetings are still considered an important communication tool that spans all management levels and supports the position of Schwartzman (1989) that meetings are the main places where organizations come into existence through talks. The fact that all levels of management rely on meetings proves Boden's (1994) idea of "the business of talk," meaning that face-to-face communication is still very important for organizational understanding even when there are technological alternatives. Lower-level management is more inclined to rely on department-wide meetings and official communication channels to pass on information, which may be a reflection of what Zack (1999) points to as differing knowledge management strategies according to the nature of the knowledge being shared, operational knowledge needing more codified channels while strategic knowledge profiting from richer, more interactive media.

The results further indicate a "communication paradox" which might be described as in the case of Rogers and Agarwala-Rogers (1976), where the communication barriers might be set up without a notice even with the use of the very structures intended for that purpose. At lower management levels, the heavy dependence on formal channels of communication, though providing consistency, may somewhat limit what Granovetter (1973) refers to as the "strength of weak ties" or the informal bonds that are the main source of access to novel information and viewpoints. To add to this, the lack of cross-level communication channels might lead to what Janis (1982) calls information silos, where strategists are the last ones to be informed about the valuable insights coming from operational levels.

In conclusion, while the different methods present different main points, ranges, and degrees of abstraction, sharing information and communicating are still the major functions that facilitate efficient management at all levels. These distinctions are reflective of what Katz and Kahn (1978) highlight as the open systems characteristic of organizations, where the different subsystems have different needs regarding information processing. The communication variation among the different levels of hierarchy is in line with the contingency theory (Burns & Stalker, 1961). Hence, it implies that there is not merely one best way to facilitate communication, but it actually depends on the tuning with the requirements of the organization and the demands of the environment applied to them. The findings still call for what Eisenberg and Goodall (2004) refer to as "strategic ambiguity", meaning being wide enough in procedure for coordination but at the same time keeping the ground for adaptation and innovation. Innovations that open up communication systems more are needed that intertwine both formal and informal channels while acknowledging the hierarchy could then make the knowledge transfer capability a source of competitive advantage that is critical in dynamic environments as identified by Argote and Ingram (2000).

Seizing capabilities

How do you mobilize and allocate resources to implement the chosen actions?

The patterns of resource mobilization and allocation analyzed, unveil different methods used by the management levels and these methods are exactly what Teece (2007) describes as the "seizing" aspect of dynamic capabilities, that is, the capacity to bring together resources for treating the situation after it has been sensed. Such different resource allocation approaches are in line with

Bower's (1970) model of the resource allocation process which shows that strategic choices are inextricably linked with the organizational context in which resource decisions are taken. It is true that the top and the middle management do look broadly at the unit's strategies like growth, hiring, resource allocation and budgeting. To quote one of the senior managers: "Our priority is to make sure that our new colleagues are well chosen and come to us." This strategic approach to human capital development is in line with Barney's (1991) concept of creating valuable, rare, inimitable, and non-substitutable (VRIN) resources that are the main source of competitive advantage. The focus on hiring and growth at the higher level is in line with Penrose's (1959) theory of firm growth, where the development of managerial resources is seen as the main limiting factor to the expansion of the organization. This strategic approach to human resource development is supported by Wright et al. (2001) who view the human capital pool and employee relationships as the key components of strategic capability.

But lower management prefers to work on more specific project-level tasks and processes, with one operational manager mentioning: "There is a clear division of tasks that allows recognizing the capacities of the team members." This operational focus mirrors Thompson's (1967) concept of the technical core of organizations, where efficiency depends on environmental uncertainties being buffered through the implementation of standardized processes. The priority given to the division of labor and the identification of workers' capacities at lower levels is in line with Grant's (1991) knowledge-based view, which highlights the role of specialization and coordination in making organizational knowledge available. Such an empirical resource allocation corresponds to the "patching" concept by Eisenhardt and Brown (1999) the strategic process of remapping resources at the operational level according to changing market opportunities.

On the contrary, top management is willing to provide their employees with the opportunity to learn and develop plus more liberty, which is supported by the quote, "We develop colleagues through education and exposing them to new tasks for experience." Such a developmental strategy corresponds to the learning dimension of dynamic capabilities as pointed out by Teece et al. (1997) where firms have to continuously change their abilities. The focus on flexibility is consistent with Volberda's (1996) definition of organizational flexibility as a meta-capability that allows companies to adapt to changes in the environment. While lower management insists on a clear delineation of tasks, a timeline, and recognition of team members' specific skills: "Management identifies the team members with the right skills, knowledge, and availability." This systematic method of allocating resources corresponds to what March (1991) calls "exploitation," the improvement and efficient use of existing competencies, contrary to the "exploration" orientation at higher levels of management.

Management at both the middle and lower levels hold the same opinion regarding the utilization of already existing tools and resources wherever it is possible. A middle manager remarked: "It is very important to know what other departments in the institution are doing and what they are using." The managers' focus on resource awareness shows the same thing as "resource orchestration" describes Sirmon et al. (2007) the whole process of structuring, bundling, and leveraging firm resources. The choice of capitalizing on existing resources is in sync with the resource-based view's clarion call that companies should acquire a distinctive combination of resources (Wernerfelt, 1984) and resonates with Kogut and Zander's (1992) idea of combinative capabilities, which suggests that competitive edge comes from integrating existing knowledge in a creatively novel manner. Nevertheless, the lower management does need to get budgets approved by higher management in the event of purchasing new tools, thus illustrating what Jensen and Meckling (1976) refer to as agency relationships and the hierarchical nature of resource allocation decisions in organizations.

Despite the differences in the management levels, everyone considers the same thing in their own way. The top management sees it as the unit's entire development which is in line with Chandler's (1962) strategy-structure model where the top management deals with long-term strategic positioning. However, the lower management looks at it in terms of creating a team of the best suited skills for the specific project ailing them to refer to what Clark and Wheelwright (1992) consider the operational challenge of resource allocation in project-based organizations. The aforementioned hierarchy in resource conceptualization gives credence to Burgelman's (1983) model of strategic behavior where different levels of the organization contribute differently to decisions made about the allocation of resources. Thus, it is quite interesting that middle management acts as a connector, looking out for lower management options but at the same time, needing financial resources from the top management. This linking role beautifully illustrates what Dutton and Ashford (1993) refer to as "issue selling," where middle managers have to present their resource demands in such a way that they gain support from senior management by relating them to the latter's priorities. Both levels are looking at the same external options and the very institution's present resources, as one middle manager commented: "Searching for tools and software in the outside market is a long and hard process; it is better to start from the inside and then go out if necessary." This simultaneous consideration indicates what Cohen and Levinthal (1990) call the trade-off between the internal and external capability development, revealing the necessity of absorptive capacity in identifying and integrating the external resources.

The results point to a process of resource allocation that is iterative, as Noda and Bower (1996) put it, or in other words where the bottom-up initiatives are matched with the top-down strategic imperatives. By checking the internal resources first before acquiring the external ones, the firms are substantiating what Dierickx and Cool (1989) call "asset mass efficiencies" the rule that the existing asset stocks make it more efficient to acquire the new ones. Also, the preference for institutional resources is an indication of the internal knowledge transfer issue that Szulanski (1996) depicts where organizations are often limited in their ability to take advantage of the existing skills across unit boundaries, even though they are accessible. In addition to that, the hierarchical differences in resource mobilization approaches might also indicate tensions in terms of what Adler et al. (2011) call the ambidexterity challenge, the need to simultaneously pace up efficiency (lower levels) and flexibility (higher levels). The unambiguous task division at operational levels, though it contributes to efficiency, might also restrict what Garud and Nayyar (1994) refer to as "transformative capacity" reallocation of resources in keeping with changing conditions on continuous basis. On the other hand, the top management emphasis on the flexibility aspect, while encouraging verification, might also create what Levinthal and March (1993) label as the danger of overdoing exploration to the detriment of exploitation.

To sum up, the management level pyramid up the unit means to take a more abstract and strategic view regarding growth, flexibility, and development. This is also true for Mintzberg's (1979) structural configuration theory, where the strategic apex deals with the long-term process of adaptation while the operating core handles the issue of efficiency. At the bottom of the level, concrete and process-oriented tasks and objectives become easier to understand and thus, Simon's (1962) hierarchy of decision-making comes into play, where operational decisions require different cognitive processes than strategic ones. Here, the middle management is the mediator of the different points of view and the needs of higher and lower management to guarantee the delivery's efficiency and effectiveness, representing what Likert (1961) referred to as the "linking pin" function, which is vital for organizational integration. The bridging role is specifically important for what Regnér (2003) refers to as the strategy-making duality between the periphery and center

of organizations. The study outcomes indicate that good resource mobilization cannot rely only on allocation processes but rather needs what Kaplan and Norton (2001) call "strategic alignment" that is, ensuring that resource decisions at all levels are in support of organizational objectives. Nevertheless, the discrepancies detected between strategic intent at top levels and operational implementation at the ground levels bring to the fore what Beer et al. (1990) term the challenge of translating strategy into action, thus implying the need for more integrated resource management systems that are capable of bridging the gaps between the different levels of hierarchy while at the same time providing the proper level-specific focus.

How do you learn from the outcomes of your actions and incorporate feedback into your processes and routines?

The examination of learning and feedback mechanisms through the various management levels uncovers notable differences in the way organizational learning takes place, thereby delineating what Argyris and Schön (1978) point out as different "theories-in-use" which dictate actual organizational behavior. The feedback and improvement mechanisms vary among the management levels in several respects as interpreted from the responses of the interviewees, thereby showcasing what Huber (1991) characterizes as the multifaceted nature of organizational learning, which involves knowledge acquisition, information distribution, information interpretation, and organizational memory.

Breadth of feedback collection

To begin with, from the perspective of the breadth, the top management gets the feedback from a wider circle of every one of the employees through the formal ways of communication like the annual reviews and brainstorming sessions. Gradually, the top management's wide approach to feedback collection is indicative of what Senge (1990) refers to as "systems thinking" the discipline of perceiving the whole instead of just the parts and comprehending the interactions among different organizational elements.

"Annual reviews with every... colleague"

"Give feedback... once a year in review"

"Collect feedback from colleagues."

This organization-wide feedback mechanism matches Cameron and Quinn's (2011) Competing Values Framework, where senior management demands thorough organizational assessment to determine the strategic direction. The official nature of such channels is equivalent to what Edmondson (1999) refers to as structured learning mechanisms that allow for open feedback through providing psychological safety. The extent of feedback at the top levels backs Crossan et al.'s (1999) 4I framework of organizational learning, particularly the "institutionalizing" level where individual and group perceptions become integrated into organizational systems. In contrast, middle management collects feedback from project teams and course participants in an informal manner which is analogous to the process of "reflection-in-action" described by Schön (1983) the ability to think while doing something. This informal, project-oriented method is a good representation of what Von Krogh et al. (2000) refer to as "knowledge enabling" contexts where learning arises spontaneously from the work process rather than forced through the structures. Lower management is very much concerned with feedback in sub-teams, which is an example of what Nonaka and Takeuchi (1995) call the "ba" or shared space where knowledge is generated from localized interactions. This limited focus at the operational level is in line with Simon (1991)

who describes “near decomposability” in organizational systems, whereby subsystems can be improved with some degree of independence.

Frequency of feedback

In terms of frequency, feedback from higher management is collected through occasional assessments, such as once a year, which corresponds to the traditional performance management cycles and may, therefore, limit what Ancona and Chong (1996) point out as the need for temporal pacing in organizational learning. Meanwhile, middle management takes feedback whenever the opportunities arise thereby illustrating what Eisenhardt and Martin (2000) describe as the improvisational nature of dynamic capabilities in turbulent environments. On the other hand, lower management conducts regular feedback sessions, hence practicing what Deming (1986) advocated in the form of continuous quality improvements through the frequent Plan-Do-Check-Act cycles of quality management. However, the higher management is witnessing all the latter processes and is thus adjusting its decisions, which is akin to what Burgelman (1991) refers to as “strategic recognition” in which top management monitors and selectively supports pattern emergence from the lower organizational levels. The variation in feedback frequency along the hierarchy is indicative of what March (1991) calls the temporal dimension of the balance between exploration and exploitation with different levels of the organization operating over different time horizons. The yearly feedback at top management might be indicative of what Tushman and O’Reilly (1996) refer to as “strategic punctuation” i.e., periodic reassessments of strategic direction. Nevertheless, the infrequency of formal feedback at top management raises concerns highlighted by Rerup (2009) who identifies the threat of “mindlessness” the organizational tendency to rely on routines without adequate attention to changing circumstances.

Sources of feedback exchange

If we concentrate by the source of exchange in the organization, we see that the top management is getting feedback directly from all colleagues, thus creating what Granovetter (1973) would call strong ties throughout the organization and these ties are supporting the flow of complex information. On the other hand, the middle management is getting informal input from both co-workers and training participants, this is a good example of what Burt (1992) calls “structural holes” the positions that unite the disconnected groups and give access to various information. The positive aspect of this dual-source feedback system is that Cohen and Levinthal (1990) consider it as improved absorptive capacity through the exposure to various knowledge sources. The lower management mostly depends on feedback coming from the sub-team, which meanwhile is facilitating what Weick and Roberts (1993) call “collective mind” within teams, but at the same time may be risking what Janis (1982) warns as groupthink due to the lack of outside views. The difference in feedback sources across levels is illustrative of what Reagans and McEvily (2003) mention as the social structure of knowledge transfer, wherein the network position affects learning effectiveness. The mix of sources available to middle management reinforces their function in what Floyd and Lane (2000) call “renewing” the organization by intermixing the external and internal knowledge. On the contrary, the seclusion of the feedback sources in the lower management may result in what Leonard-Barton (1992) calls “core rigidities” a situation where the capabilities that were once valuable become an obstacle to change.

Focus and application of feedback

In the area of focus, the top management is out to find the general areas in which processes can be improved, which is exactly what Argyris and Schön (1978) refer to as "double-loop learning" questioning the very assumptions and having the norms of the organization changed rather than correcting errors only in the existing frameworks. The whole approach to improvement is thus in line with what Sitkin et al. (1994) label as "intelligent failure" making systematic learning from unsuccessful attempts to enhance future performance. Yet, the middle managers are occupied with "lessons learnt" for the upcoming projects, as their statements testify: "Having informal discussions within project teams about 'lessons learnt' and what could be improved for next time." This kind of learning, attributing to the project, is one of the examples of Zollo and Winter's (2002) deliberate learning mechanism and thus codifying experience into better routines. The middle management insistence on lessons learned is analogous to what Schindler and Eppler (2003) "harvesting project knowledge" the systematic capture of insights from temporary endeavors. This method aids what Prencipe and Tell (2001) classify as inter-project learning whereby the knowledge acquired in one project context is transferred to the next ones. Additionally, the lowest management looks at the specific processes, bottlenecks, and inefficiencies: "indicate which parts of the process did not work as effectively as planned." The focus on detail shows what Argyris and Schön (1978) call "single-loop learning" the detection and correction of errors within the existing operating norms without probing the fundamental assumptions.

The main operational focus on process optimization at the lower levels corresponds with what Imai (1986) describes as "kaizen" continuous incremental improvement. This detailed process analysis is in line with Adler and Clark (1991) who define learning-by-doing as tacit knowledge about work processes being built up through continuous practice and systematic watering. However, the tight focus on the immediate process might miss what Kim (1993) warns as the difference between operational learning (know-how) and conceptual learning (know-why), thus limiting the flow of insights to new areas.

Integration and organizational learning

The results uncover the struggle mentioned by Crossan et al. (1999) of the feed-forward learning (exploration) and feedback learning (exploitation) which they interpret as part of the 4I framework. The higher management's broad, infrequent feedback mechanisms are a part of the process that supports strategic renewal and exploration while the lower management's narrow, frequent feedback is a part of the process that enables operational refinement and exploitation. This bifurcation is indicative of what Levinthal and March (1993) pose as the balancing act of myopic learning (over-specialization on current competencies) versus hyperopic learning (excessive focus on distant opportunities).

Added to that, as the management level becomes more specific and localized, the feedback mechanisms become narrower in breath, more frequent, focusing more on the internal aspect and, finally, yielding the most tangible process improvements. This is the very case that seems to correspond to Hedberg's (1981) explanation of learning hierarchies in organizations, where various levels of the organization engage in different kinds of learning activities. The increasing specificity at lower levels is supporting what Nelson and Winter (1982) have termed routines of the organization, the "genes" of firms that harbor operational knowledge. Nevertheless, all levels are after the same: improving themselves through feedback and lessons learnt, which indeed is what Garvin (1993) describes as the traits of learning organizations drawn from systematic problem-solving, experimentation, and knowledge transfer.

Therefore, the distinct viewpoints collaborate among themselves to select and refine processes at various levels, thus creating a scenario that is a perfect example of what Tushman and O'Reilly (1996) call organizational ambidexterity - the capability to concurrently pursue both incremental and radical innovation. This multi-layered learning system is what Argote and Miron-Spektor (2011) support by an argument of organizational learning systems that are able to maintain a balance between exploration and exploitation at different organizational levels. However, the evidence also points towards the possibility of fragmentation in what Fiol and Lyles (1985) have termed organizational versus individual learning, where the understanding that has been developed at one level is not easily transferable to another.

The absence of deliberate systems that allow the mastering of learning through all strata raises the fear of companies getting stuck in what Levitt and March (1988) call competency traps, where they get ever more skilled at performing the obsolete tasks. The upper management feedback, which is given once a year, can be missed by the caution of Repenning and Sterman (2002) regarding the capability traps created in the process of continuous improvement, where long-term potential is lost due to short-term pressures. Inter-level knowledge sharing being very limited indicates that the internal stickiness barriers that Szulanski (2000) speaks of still exist, albeit employees are willing to share knowledge. To improve organizational learning efficiency, the research points to the necessity of what Garvin et al. (2008) call "learning organizations" which are able to completely turn past experience into better performance through interlaced educational practices. The process of making feedback loops stronger that link operational understanding to strategic choices and at the same time allowing the directions from the strategy to inform the operational improvements is what Zollo and Winter (2002) perceive as the knowledge evolution cycle. It seems also, that if what Schippers et al. (2015) call "team reflexivity" the extent to which teams collectively examine and change their functioning across all management levels, is implemented; this will result in learning to be more integrated while still being focused and on an appropriate frequency for each level.

Transforming capabilities

How do you foster a culture of innovation and experimentation within the unit?

The dissection of the innovation culture shows the presence of distinct but also supporting methods throughout the different levels of management. This situation is in line with what Teece (2007) characterizes as the "seizing" capability, which is the ability of an organization to make use of its resources in a way that not only addresses the opportunities but also leads to profits. The results obtained are indicative of multi-level processes that contribute to the generation of innovation and, thus, they validate Van de Ven et al.'s view (1999) that the "innovation journey" is a non-linear, cumulative sequence of activities unfolding at various organizational levels.

Strategic enablement of innovation culture

The top management is going for a high-level and more strategic approach, which mainly revolves around changing the culture open to the public, idea generation, and innovating testing, and finally, learning from the others. The senior manager had their words on this:

"Working group on our didactics and teaching approaches to revive...bringing in innovations."
"Revising...if colleagues have some ideas, we try to implement them."

This strategic orientation toward innovation culture depicts the major role of leadership in organizational culture formation and management acknowledged by Schein (2010). The openness

and idea generation usage coincide with Amabile's (1998) componential theory of creativity wherein organizational backing for innovation is the most environmental component affecting the stage of creativity amongst the others. The creation of working groups for pedagogical innovation is one of the ways to implement what Burgelman (1983) calls "internal corporate venturing" mechanisms that allow for exploratory activities to be carried out alongside the routine ones.

One can say that the management of the unit is thus portraying Tushman and O'Reilly (1997) concept of ambidextrous leadership which is the ability to support both minor and major innovations at the same time. The unit's drive to accept colleagues' ideas is evidence of Kanter's (1988) power tools of innovation leaders that include pumping resources, giving, and helping with information as well as providing the right supportive environment for innovation. Such a positive attitude towards the bottom-up ideas is in line with Burgelman (1991) concept of autonomous strategic behavior where strategy evolves from initiatives not covered by the formal planning process.

Moreover, the importance of learning through others is similar to what Chesbrough (2003) calls "open innovation" where organizations have to harness both external and internal ideas for technology and business model improvements. This perspective that looks outward is in line with what Cohen and Levinthal (1990) call absorptive capacity developing in which organizations must continuously interact with external knowledge sources to spot and incorporate the information that is valuable to them.

Practical implementation and psychological safety

In addition to this, the middle and lower management mainly devote their attention to the practical measures that are required to support and put into effect innovation. This can be likened to what Floyd and Wooldridge (1999) refer to as the championing and facilitating roles of middle management in strategy implementation. Nevertheless, the managers are sure to create a safe atmosphere and to mingle in a cordial manner to the point that the workers not only feel free to express their views but they also engage in what is known as psychological safety, as Edmondson (1999) has put it. The argument in favor of safety is very strong since, for instance, Baer and Frese (2003) show that psychological safety does indeed allow the necessary innovation processes of trial, error and learning from failure to take place.

The emphasis placed on "good spirit" and the supportive surroundings conforms to what Amabile et al. (1996) point out in their KEYS evaluation of the creative atmosphere, where the fostering of creativeness, liberty and positive team dynamics resulted in the enhancement of innovative outputs. This practically oriented process for laying the ground for innovation is in agreement with what Kanter (1983) refers to as the "architecture of innovation" the organizational structures and practices that facilitate the solving of creative problems through drawing on various ideas.

Multi-level involvement in innovation processes

All in all, all the different levels of management recognize the value of involving different people, but their ways of doing so vary, which is consistent with the idea of participative safety being crucial for team innovation that West (2002) points out. The senior management invites input from coworkers through brainstorming sessions and working groups, relying on what Osborn (1953) called the structured ideation techniques, even though the contemporary research by Sutton and Hargadon (1996) suggests that the benefit of brainstorming is not so much in producing the best ideas but in creating collective memory and understanding among the participants. The working groups exemplify the concept of communities of practice as described by Brown and Duguid (1991),

where innovation is the result of collective participation rather than the work of one single genius. This methodology is in line with the view of Nonaka and Takeuchi (1995) who refer to the "knowledge creation company," the establishment of cross-functional teams being the most important method for converting tacit into explicit knowledge via social interaction.

Middle management is characterized by the practices of continuous interacting and communicating clearly with others, thus embodying what Dougherty and Hardy (1996) see as the very bridging function needed to break through the organizational divisions that create barriers to innovation. This very interaction support gives credence to what Carlile (2004) calls the "pragmatic" boundary-crossing capability, where knowledge must go through the process of negotiation and transformation across the different domains. Still, lower management is the one that actively involves all staff levels in the innovation process, thus implementing what Burgelman (1983) refers to as "induced strategic behavior" where the operational employees do contribute to the strategic initiatives. The active engagement of all levels of staff in operational management is what Von Hippel (1988) classifies as "lead user" innovation where those who are nearest to the problems usually create the most suitable solutions. This exclusive solution is consistent with what Damanpour (1991) discovered through his meta-analysis: that organizational innovation is positively correlated with specialization, functional differentiation, and professionalism, which are all the more so when various staff input is there.

Communication, vision, and diversity in innovation

Furthermore, the middle management has to communicate clearly with the top management as Dutton and Ashford (1993) argue that this issue selling is the process through which the members of the organization affect the strategic attention and the allocation of resources. Communication plays a part in its support of what Floyd and Wooldridge (1992) consider the synthesis of information by middle management, i.e., converting operational innovations into strategic language. For the upper management, the sharing of ideas within the project teams has been a major come-through, demonstrating the Hargadon and Bechky (2006) concept of "collective creativity," where coworkers generate and develop ideas through social interaction.

The emphasis on open idea sharing is a clear indication of what Leonard and Swap (2005) refer to as deep smarts transfer, where tacit knowledge is passed on through storytelling and collaborative problem-solving. This openness is in line with a finding by Brown and Eisenhardt (1995) that successful innovation in their product development study was characterized by a semi-structured organization with very clear responsibilities and at the same time a flexible approach to problem-solving.

Moreover, middle management acknowledges the necessity of having a suitable "vision" to inspire innovation, thus corroborating Collins and Porras (1996)'s assertion of the power of vision in driving progress while maintaining core values. This focus on vision is in line with Kotter (1996) who points out the necessity of creating and communicating a compelling vision that directs innovative endeavors for this reason: leading change. The aspect of motivation inherent in the vision is a reflection of what Amabile (1997) calls intrinsic motivation, the person's urge to work on a project simply because it is interesting, participating or it is a personal challenge, which she considers among the most important reasons for creativity. Lower management concentrates on variety of ideas, testing pilots and obtaining different views through conferences and other kinds of networking input.

This diversity focus is in keeping with what Page (2007) shows mathematically: that diverse problem-solvers very often outperform groups of top problem-solvers because they bring different

outlooks and heuristics. The adoption of pilot experiments is in line with what Thomke (2003) proposes in "enlightened experimentation," where quick and cheap prototypes lead to learning and innovation. The networking for various viewpoints supports what Granovetter (1973) points out as the power of weak ties in gathering new information, and what Burt (2004) describes as structural holes, the competitive edge gained from connecting separated groups. The participation in conferences is in agreement with what Swan et al. (1999) discover as boundary-spanning activities that make organizations receptive to new knowledge and practices.

Integration and multi-scale innovation

In conclusion, top management alters its priorities and directs its vision to the new objective of supporting through operations the development of a widespread innovation culture, which finally leads to the creation of the so-called deathless conditions for the supporting and implementation of creative ideas. This concept of the strategic-to-operational translation is what Teece (2007) refers to as the microfoundations of dynamic capabilities; hence, sensing and seizing need to be facilitated through organizational levels. Moreover, the different levels in the organization are all in agreement that the involvement and interactions with diverse people in the right manner are crucial for innovation generation, which supports Hargadon and Sutton's (1997) notion of "technology brokering" innovation by collaborating through the mixing up of ideas of different domains. Therefore, the concepts of openness, interdepartmental cooperation and learning from others are still prevalent everywhere, characterizing the change that Chesbrough and Appleyard (2007) cite as the gradual transition towards more open business models, where companies are required to take part in collaborative innovation. The stress laid on working together across different levels correlates with what Hansen and Birkinshaw (2007) call the innovation value chain, where the stages of idea generation, development and diffusion have to be managed effectively. The divergent but interrelated points of view make it possible for the unit to innovate on several scales, which is what Gupta et al. (2006) classify as ambidexterity through differentiation, where various organizational units or levels carry out both exploration and exploitation concurrently. This multi-level innovation system is one of the points made by Crossan and Apaydin (2010) in their comprehensive framework: that corporate innovation takes place at different levels (individual, group, organizational) and through various dimensions (process, product, strategic, behavioral).

Notwithstanding, the findings also indicate difficulties which O'Reilly and Tushman (2013) define as the ambidextrous organization. In case of the higher management, it will be more about creativity than in case of the lower one where the innovation will be the implementation of practical experiments; the coordination between levels, however, may encounter the organizational factors mentioned by Jansen et al. (2009) that block the development of ambidexterity: the lack of clear responsibilities, poor integration mechanisms, and the existence of conflicting incentives. The different levels of strategic vision at the top, psychological safety in the middle, and practical experimentation at the bottom have to be coordinated through what Gibson and Birkinshaw (2004) call a "supportive context" which allows individuals to make their own decisions about how to split their time between alignment and adaptability. Moreover, although all levels appreciate the participation and transparency, the absence of organized methods for identifying and expanding the successful innovations could mean that what Szulanski (1996) refers to as internal stickiness in best practice transfer is not possible. The pilot experiments at lower levels, though they are very useful for local learning (March, 1991), might not be transformed into organizational-level capabilities without the use of what Winter and Szulanski (2001) refer to as replication mechanisms.

The research results advocate the adoption of entirely new management practices, dubbed "management innovation" by Birkinshaw et al. (2008), which will result in the re-organization and at the same time the complete re-definition of management work. Gradually creating more methodical processes of idea capture, evaluation, and scaling across levels could not only help but also keep at all levels the psychological safety and openness which are being valued, thus uniting and strengthening the innovation capability identified by Lawson and Samson (2001) as the ability to transform knowledge and ideas into new products, processes, and systems benefiting the organization continuously and effortlessly.

How do you cope with uncertainty and ambiguity in your decision-making?

The scrutiny of decision-making amidst uncertainty highlights the fundamental variances in management levels' handling of ambiguity, which mirrors what was termed as bounded rationality by March and Simon (1958) the cognitive limits that determine the organization's decision-making process. These results shine a light on the fact that the various strata in an organization have different tactics for dealing with what Knight (1921) referred to as "true uncertainty" scenarios where it is impossible to derive probabilities as opposed to calculable risk situations.

Experience, intuition, and acceptance of uncertainty

In detail, higher management strongly relies on experience, intuition and accepting uncertainty in decisions. As senior managers articulated:

"You grow where you learn over time to base your decision on experiences."
"Uncertainty and ambiguity are part of any decision."
"Also, a little bit on your gut feeling."

The decision-making process of the experts the same as by what Klein (1998) referred to as "the recognition-primed decision model," wherein the expert decision-makers identify the patterns from the last occurrence and pick the right reactions without long discussion. The experience being the main factor that supports Mintzberg's (1989) statement about "crafting strategy," where the great strategic decisions are made not through pure analytics but through the close-up knowledge gained over time. It is the acceptance of uncertainty at higher management levels that corresponds to what Weick et al. (2005) mention as one of the traits of organizational resilience: the recognition of the limits of prediction and planning in complex, fluctuating environments. This philosophical stance is a reflection of what Courtney et al. (1997) describe as decision-making at higher levels of uncertainty, where traditional analytical tools provide limited assistance and judgment is the only way to go. The use of "gut feeling" embodies what Dane and Pratt (2007) consider to be intuition – affective judgments that happen through a fast, non-conscious, and holistic connection of ideas. Khatri and Ng's (2000) work show that intuitive synthesis is very useful in unstable environments where analytical methods may be too slow or half-baked. Despite this, at the top level, the high trust put in intuition also poses dangers that Kahneman and Tversky (1979) cataloged in their prospect theory: a biased judgement under uncertainty which is systematic, and includes overconfidence and anchoring effects, among others. The saying about acquiring through experience indicates what Lampel et al. (2009) mean by "learning from rare strategic decisions," although this learning might be limited due to small sample sizes and errors in attribution.

Practical uncertainty reduction strategies

Conversely, the middle and lower management of the unit point at the use and execution of practical strategies such as research, consulting others and experimenting as the primary means

to turn down the uncertainty. Proactive management of uncertainty in this manner is akin to what Thompson (1967) described as the fundamental drive by organizations to isolate their technical core from the environmental uncertainties and to do it by employing different strategies. The focus on research resembles Galbraith (1973) who called it the information processing view of organizations, where uncertainty generates information processing needs that organizations have to fulfill through proper channels. Thus, both middle and lower management take the same position and are prepared to dialogue with the others, getting feedback from them, and talking to the veterans involved before deciding anything. This intra-management communication under uncertainty is what Lipshitz and Strauss (1997) call "reducing uncertainty" and as major coping strategies, "assumption-based reasoning." The process of getting early feedback is in line with what Eisenhardt (1989) discovered in their research on fast strategic decisions: that quick decision-makers have more nor less information and draw help from seasoned counselors. Seeking advice from people with experience means that the person is going through the process of what Argote (2013) calls organizational learning via knowledge transfer, where the tacit experiential knowledge is acquired and used to inform decisions. This practice is in accordance with the theory of Weick (1995) on "sensemaking" the notion that every organization has its own way of doing things and it is members who through collective effort construct a shared understanding of what is going on in the environment. As one manager noted:

"For difficult decisions, the respondent's own research is crucial."
"Once the respondent comes up with an initial idea or solution, they try to speak to someone about it as soon as possible before overthinking it themselves."

The mixture of individual inquiry along with quick consultation mirrors what Janis and Mann (1977) refer to as vigilant information processing, which is a moderate way of handling the situation so that neither premature closure nor decision paralysis takes place. The fact that the group talks to others "before overthinking" shows that they are conscious of the "paradox of choice" which Schwartz (2004) discusses. In the latter case, long-drawn-out discussions can result in paralysis over the decision taken and satisfaction reduced.

Differential attitudes toward risk and uncertainty

Moreover, middle management recognizes the necessity of risk and uncertainty acceptance but at the same time labels it as a hard task. This confession of hardship corresponds with Milliken (1987) who singles out three types of perceived environmental uncertainty: state uncertainty (the environment being unpredictable), effect uncertainty (not being able to predict the impact of the organization), and response uncertainty (uncertainty regarding response options). The middle management stance indicates that they are undergoing all three types of uncertainty at the same time. On the other hand, the lower management is striving to get rid of ambiguous decisions and actions through the institution of structured processes and communication. Such preference for structure is in line with Perrow's (1970) view of decision-making being rooted for reliability, and variance in outcomes to be lessened, He considers it a 'routinization of decision-making.' The prevalence of structured processes has a direct connection to 'programmed decisions' as defined by March and Simon (1958) these are the decisions that may be dealt with via the use of already existing procedures. While the higher management accepts uncertain situations in decision-making as a natural given situation and at the same time illustrates what Lüscher and Lewis (2008) call paradoxical leadership, the capability of holding competing demands at once.

The aforementioned means of expressing uncertainty through a hierarchical lens corroborate the findings of Hough and Ogilvie (2005) where it was conclusively pointed out that not only do

managers from different levels view environmental uncertainties differently, but also, they respond to them differently with top managements being the most tolerant ones amongst the group. The varying levels of uncertainty on the part of the management might be, as Schreyögg and Sydow (2011) suggest, an organizational path dependency where lower managerial ranks get trapped in the existing routines that are less adaptable and thus, they lose the opportunity to change and to be more flexible.

Information processing and decision authority

Moreover, the research processing is a major factor in middle management's hard decisions and this is in line with what Fredrickson and Mitchell (1984) termed the comprehensiveness of strategic decision processes, the extent to which an organization makes huge efforts in being exhaustive in making and integrating strategic decisions. On the contrary, lower management is keen on assuring that the actions to be taken after the decision have been clarified through regular meetings and clear processes, which is what Nutt (1984) identifies as implementation tactics that enhance decision success.

Brunsson (1982) speaks of the "irrationality" of the whole decision-making and the consequent operational necessity of doing such things as reducing ambiguity and building commitment through this very same process. The Bruch and Ghoshal (2004) notion of intentional action, which is considered as an organization that has ''high energy and focus [and] that directs all its resources towards the goals valued by the organization'' spreads to the entire operation as a result of this decision-making infrastructure. In other words, lower management decisions are limited by the hierarchy level and functions and hence are considered to be congruent with Simon's (1947) depiction of the decision-making hierarchy where the decision grounds go down and the information comes up. The limitations in decision-making power reflect what Jaques (1990) names "requisite organization," which implies that the level of hierarchy corresponds to the complexity of decision-making. Nevertheless, middle management recognizes the need to make a decision when the necessary information is collected, despite the fact that their tasks are to be the most critical ones of course delivery. This recognition is indeed a reflection of Eisenhardt and Zbaracki (1992) where in their review of strategic decision-making they state that effective decisions very often require proceeding with "good enough" information instead of perfect knowledge. The middle management position presupposes what March (1994) calls experiential learning under ambiguity, with the main character acting in the light of action before the full understanding is achieved. Meanwhile, Weick (1979) poses the same question: "How can I know what I think until I see what I say?" thus indicating the intertwined nature of action and understanding rather than a sequential one.

Integration and organizational decision-making capability

To summarize, the three levels of management present the acceptance of uncertainty as the most preferable option if not practiced through researches, feedback, and clear implementations. This approach reveals what Duncan (1972) classifies as an organization's response to perceived environmental uncertainty, where a structural and information processing solution is integrated. The fusion of acceptance and reduction techniques corresponds to Sutcliffe and Zaheer (1998) description of uncertainty management as a combination of flexibility to adapt and stability to execute. Experience has been and still will be crucial in decision making at all levels of management even if strategies are not the same. The experience handed down is therefore what Kolb (1984) depicts in experiential learning theory, where concrete experience is the starting point for reflection, conceptualization, and active experimentation. The varied strategies across levels are a strong

indication of what Hodgkinson and Clarke (2007) recognized in their review of managerial cognition: that effective decision-making necessitates the balancing of intuitive and analytical approaches, with the right balance changing and determined by context and hierarchical level. The finding, however, can be interpreted to indicate a "certainty gap" by the hierarchical levels. Higher management has the vision of accepting uncertainty in principle while middle and lower management are not able to perform effectively without clearer direction. This gap mirrors what Eisenhardt et al. (2010) illustrate as simple rules in complex situations: senior managers might be secure with ambiguity as they are working with broad principles, whereas operational managers need specific guidance for implementation.

The varying degrees of comfort with uncertainty may result in the organizational stress described by Furnham and Ribchester (1995), in which the mismatches of the tolerance for ambiguity create conflicts. The structured processes at the lower levels may also limit the "improvisation" (Weick, 1998) necessary for innovation and crisis response, even though they reduce uncertainty locally. Moreover, the use of personal knowledge and instincts at the top level may be seen as a factor that intensifies the observation of Lovallo and Sibony (2010) about strategic decision-making being plagued by systematic biases. If the assumption is not challenged through structured processes, the senior managers may be subjected to the cognitive heuristics recognized by Tversky and Kahneman (1974) that yield reliable biases: availability (giving too much weight to the last or the most striking information), representativeness (making broad conclusions from small samples), and anchoring (not adjusting enough from the first estimates). The implications call for what Snowden and Boone (2007) offer in terms of their Cynefin framework: pairing the decision-making methods with the complexity of the problem. The structured processes and best practices are advantageous for the simple, ordered problems (which are often found at the lower levels). The complicated issues (which are more likely to occur at the senior levels) need probe-sense-respond methods that work with the evolving comprehension. Nevertheless, the organization lacks the proper tools to pinpoint the type of problem being faced.

In order to improve organizational decision-making under uncertainty, the researchers recommend the adoption of what Courtney (2001) calls "strategic learning", which are systematic procedures for the reduction of uncertainty where it is possible and at the same time building up the organization's adaptive capacities to manage the remaining uncertainty. Creating scenario planning capability as described by Schoemaker (1995) could enable the bridging of hierarchical gaps, making it possible to discuss uncertainty in a structured way that preserves intuition which is of great value. Moreover, according to Edmondson (2012), "teaming" which is the dynamic collaboration across boundaries, could allow the seasoned managers' intuition based on experience to be combined with the research-oriented approaches of the middle and lower management, thus creating the organizational learning as suggested by Crossan et al. (1999) that flows both forward (exploration) and backward (exploitation) across levels.

CONCLUSION

Theoretical and empirical contributions

This study set out to investigate how a sustainability-focused educational unit at a triple-crown-accredited business school uses its dynamic capabilities to transform its resource base. Drawing on semi-structured interviews with managers at three hierarchical levels and a hybrid theory-guided/inductive thematic analysis, the research has generated findings that speak to all three dynamic capability stages identified by Teece et al. (1997): sensing, seizing, and transforming.

The most important and theoretically generative finding concerns the unit's sensing capabilities. All three levels of management actively engage in environmental scanning: attending conferences, reviewing publications, analysing competitor activity, and monitoring student and stakeholder feedback, demonstrating what Day and Schoemaker (2006) call 'peripheral vision.' The senior manager confirmed that the unit keeps a close eye on emerging trends in sustainability education, stating: "We always follow what others are doing and try to see where the field is heading." However, no systematic, documented process exists for escalating these signals upward or converting them into strategic decisions. This sensing gap, a disconnect between rich environmental intelligence gathered at the operational level and the absence of a formal knowledge-conversion mechanism at the top, constitutes the study's primary empirical contribution. It echoes Eisenhardt and Martin's (2000) warning that strong sensing is insufficient without effective seizing-to-transforming pathways, and it resonates with Helfat and Peteraf's (2015) call for systematic 'sensing mechanisms' in organizational design.

With respect to seizing capabilities, the data reveal a form of organizational ambidexterity (O'Reilly and Tushman, 2008): top management focuses on long-term strategic hiring and capability building, as evidenced by the senior manager's remark that "our priority is to make sure that our new colleagues are well chosen and come to us" while junior management concentrates on exploiting existing tools and processes, and middle management serves as a bridge between exploration and exploitation. Resource allocation follows hierarchical authorization pathways consistent with Bower's (1970) process model. While this division of labour is functional, it occasionally creates coordination lags when new opportunities require rapid cross-level resource reconfiguration.

Transforming capabilities are visible in the unit's commitment to iterative curriculum renewal, stakeholder-responsive programme adaptation, and a culture that treats diversity and collaborative experimentation as enabling conditions for innovation. All three managerial levels value feedback, though learning loops remain informal and are not yet codified into standardized organizational routines, a gap that limits the unit's capacity to institutionalize its accumulated experience (Zollo and Winter, 2002). Decision-making under uncertainty is handled differently across levels: senior management relies on experience-based intuition, while middle and junior management prefer structured research and consultation, creating a "certainty gap" that structured scenario planning could help to bridge.

Practical recommendations

The findings support four concrete recommendations. First, and most critically, the unit should institutionalize a systematic sensing pipeline: a formalized process for capturing, documenting, and routing environmental signals from all hierarchical levels to senior decision-makers. This could take the form of a shared knowledge repository, regular horizon-scanning workshops, or a cross-level innovation committee with a mandate to convert conference insights and competitive intelligence

into strategic proposals. Second, the unit should codify its learning loops by creating after-action review protocols following major programme launches or partnership initiatives, transforming tacit managerial knowledge into transferable organizational routines. Third, cross-level communication channels should be enriched with informal mechanisms alongside formal meetings, reducing the "knowledge boundary" (Carlile, 2004) effects that currently impede the upward flow of operational intelligence. Fourth, scenario planning exercises involving all three hierarchical levels would help bridge the certainty gap in decision-making and build shared strategic frameworks that respect both senior intuition and junior empirical rigour.

Limitations and future research directions

The findings of this study must be interpreted with the inherent constraints of its design clearly in mind. The single-case, three-informant design provides depth and hierarchical breadth but restricts external validity: conclusions are explicitly exploratory and illustrative rather than statistically generalizable, and they may reflect the idiosyncratic features of this particular unit's culture, leadership style, and institutional context. The reliance on self-reported interview data introduces the possibility of social desirability bias, even though triangulation across hierarchical levels partially mitigates this. The absence of quantitative performance metrics, such as enrolment trends, revenue data, or SDG impact scores, means that the link between resource reconfiguration and strategic outcomes remains inferential rather than empirically established. Finally, the cross-sectional design provides a point-in-time snapshot and cannot capture how dynamic capabilities evolve over time.

Future research should address these limitations through comparative multi-case studies across triple-crown institutions in different national contexts, longitudinal designs that track capability development over multiple academic cycles, and mixed-methods approaches that integrate quantitative performance metrics with qualitative capability mapping. Researchers might also investigate whether the sensing gap identified here is a structural feature of small, hierarchically differentiated educational units more broadly, or whether it is an artefact of this particular case. The proposed "dynamic capabilities pipeline" model developed here offers a theoretical scaffold that could be operationalized and tested in such future investigations.

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