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*UNDERSTANDING CHANGES IN THE BUSINESS MODEL FROM
ENTREPRENEURIAL BEHAVIORAL CHARACTERISTICS BY DAVID
MCCLELLAND¹*

**COMPREENDENDO MUDANÇAS NO MODELO DE NEGÓCIOS A PARTIR
DE CARACTERÍSTICAS COMPORTAMENTAIS EMPREENDEDORAS DE
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ABSTRACT

This study examines the correlation between the Entrepreneurial Behavioral Characteristics (CCEs) proposed by David McClelland and the changes in the Business Model Canvas (BMC). The objective was to understand how the CCEs present in three different entrepreneurs impacted the modification of their respective companies' BMCs to overcome the difficulties that arose during the COVID-19 pandemic. For this purpose, we analyzed the changes in the BMC of three companies in the children's party sector in Curitiba, PR, in the pre, during, and post-pandemic contexts. Additionally, the CCEs of each entrepreneur were identified through questionnaires. Finally, the changes in the business model components were correlated with the characteristics of each entrepreneur. The analysis revealed that the connection between these tools (BMC and CCEs) did not present a consistent pattern for all cases. However, it was possible to correlate the characteristics and changes in the business model by understanding the context, motivations, and strategies used by each entrepreneur.

Keywords: pandemic, business model canvas, entrepreneurial behavioral characteristics.

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RESUMO

Este trabalho apresenta o estudo sobre a correlação entre as Características Comportamentais Empreendedoras (CCEs) propostas por David McClelland e as mudanças ocorridas no *Business Model Canvas* (BMC). Objetivou-se compreender como as CCEs presentes em três diferentes empreendedores impactaram a modificação do BMC das respectivas empresas para contornar as dificuldades surgidas na pandemia de COVID-19. Para isso, verificamos as mudanças ocorridas no BMC de três empresas do setor de festas infantis na cidade de Curitiba-PR no contexto de pré, durante e pós-pandemia de COVID-19. Junto a isso, foram traçadas, por meio de formulários, as CCEs de cada empreendedor. Por fim, as mudanças ocorridas nos componentes do modelo de negócios foram correlacionadas com as características de cada empreendedor. Através das análises, foi visto que a conexão entre essas ferramentas (BMC e CCEs) não apresentou um padrão para todos os casos. No entanto, foi possível correlacionar as características e as mudanças no modelo de negócios, compreendendo o contexto, as motivações e estratégias utilizadas por cada empreendedor.

Palavras-chave: pandemia, modelo de negócios canvas, características comportamentais empreendedoras.

INTRODUCTION

According to Joseph Schumpeter (1942), entrepreneurs are the agents of change in the economy, whose innovations and new methods of production continually reshape the business environment. He also considers that entrepreneurship involves the introduction of new products, production methods, markets, and forms of organization. These disruptive innovations are what drive economic growth and development, even if this means the obsolescence or destruction of existing firms and structures. This does not occur in a negative sense but rather refers to a process of transformation, in which continuous innovation destroys old structures and creates new ones, leading the economy into a state of ongoing evolution (SCHUMPETER, 1942).

Given its relevance, entrepreneurship is under constant observation by entities such as the Global Entrepreneurship Monitor (GEM, 2024), which



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conducts comprehensive analyses of entrepreneurial dynamics on a global scale. In addition, there is a continuous focus on the development of methodologies and instruments designed to support entrepreneurs. Among them, the Business Model Canvas (BMC), led by Alexander Osterwalder, stands out as an effective strategic management tool for designing and visualizing both new and existing business models in a visual and intuitive way, with particular emphasis on companies' value propositions (OSTERWALDER, 2004). In addition to the BMC, there are other complementary tools, such as SWOT analysis, used to identify the Strengths, Weaknesses, Opportunities, and Threats associated with a business initiative (LEIGH, 2009).

The applicability of the BMC extends beyond the evaluation of individual companies (SANTOS et al., 2020; TEIXEIRA; LOPES, 2016), also being used to capture the essence of certain types of businesses through the creation of generic BMCs for specific segments (BREHM, 2018; CABRAL, 2021; GIRARDI, 2014). Furthermore, innovations such as the incorporation of sustainability dimensions reflect the evolution of contemporary business thinking (CARDEAL et al., 2020). Another study explores the impact of the COVID-19 pandemic on the business models of companies in the events sector in Curitiba, demonstrating the flexibility and relevance of the BMC for understanding the dynamics of changes that occurred in business models in a challenging context (AMARAL; MIYATAKE, 2023). This diversified approach to entrepreneurship provides insights for entrepreneurs and contributes to the development of more resilient and adaptable strategies in response to constant market changes.

Although understanding organizational dynamics is an important step, the analysis of entrepreneurship goes beyond observing companies and markets, also encompassing entrepreneurs individually. Various methodologies are employed to decipher the entrepreneurial profile, ranging from the investigation of behaviors (SCHMIDT; BOHNENBERGER, 2009) to the analysis of personality



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traits, with the creation of specific tools for this purpose (SOUZA; LOPEZ JR., 2005). Among the applied methodologies, David McClelland's research stands out as a milestone in understanding entrepreneurial drive, focusing particularly on entrepreneurs' needs to define and achieve ambitious goals (MCCLELLAND, 1972). This willingness to face challenges not only catalyzes the ability to navigate adversity with resilience and innovation but is also a fundamental pillar of success. In addition to this central characteristic, later studies identified other behavioral traits of the entrepreneurial spirit, such as Opportunity Seeking and Initiative (MSI, 1990). This approach emphasizes the complexity of the entrepreneurial profile, recognizing the interaction among various behavioral traits and their influence on business success.

The wide range of research available in the academic literature highlights the applicability of studies on the entrepreneurial profile in different contexts, including academic (KRÜGER; MINELLO, 2018; KRÜGER; MINELLO; PORTO, 2018; MINELLO; BÜRGER; KRÜGER, 2017) and business settings (OLIVEIRA et al., 2014; DIAS et al., 2010; CLEMENTE; DE ALMEIDA, 2013; C MARA; ANDALÉCIO, 2012), demonstrating the versatility and relevance of this field of investigation. These analyses seek to uncover the distinct characteristics that define entrepreneurship in different spheres, fostering understanding and encouraging entrepreneurial activity across varied environments and sectors.

Although the tools and others developed can be applied individually, combining them can enrich the understanding of organizations and entrepreneurs' profiles. Therefore, based on the analysis of changes observed in the Business Model Canvas of companies located in Curitiba during the pandemic, as discussed in a previous study (AMARAL; MIYATAKE, 2023), this research aims to answer the following question: How can entrepreneurial behavioral characteristics be associated with changes that occurred in the BMC? The objective is to correlate the characteristics inherent to entrepreneurs,



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considering the Entrepreneurial Behavioral Characteristics (EBCs), with the modifications identified in each component of the BMC. To this end, questionnaires were administered to entrepreneurs to identify the EBCs and relate them to the changes that occurred in the business model, as discussed in the literature.

Thus, the article was organized as follows: in the Theoretical Framework, we present the central ideas about the EBCs and the BMC; in the Methodology, the type of research and details about data collection are explained; in the Results and Discussion section, the results obtained from the collected data are presented; and finally, in the Conclusions, the appropriate considerations regarding the study are provided.

THEORETICAL FRAMEWORK

Entrepreneurship, as a characteristic, is defined as an individual's ability to solve problems, generate opportunities, create innovative solutions, and invest in projects with significant impact (SEBRAE, 2021). It is crucial to understand that entrepreneurship represents more than the launch of products, services, or new companies; it also includes the ongoing management of these initiatives. This process can be divided into three phases: identifying an opportunity or generating an innovative idea, securing resources, and finally launching and developing the business, culminating in success and the attainment of rewards (BARON; SHANE, 2010). The starting point is recognizing an opportunity generated by technological changes, raw materials, processes, or socioeconomic conditions. After identifying this opportunity and formulating an idea, the next phase involves mobilizing the necessary resources and developing a detailed plan for the venture's implementation. With the launch of the business, crucial decisions regarding legal aspects, product or service development, team formation, and other fundamental issues must be made to ensure the company's success. The



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final stage involves capitalizing on success by attracting talent, strengthening strategies, and managing the challenges of growth. These phases are influenced by individual factors, such as skills and motivation, as well as external factors, including interpersonal relationships and social conditions such as technology, the economy, and public policies, highlighting the dynamic nature of the entrepreneurial process.

It is evident that entrepreneurship is intrinsically linked to the entrepreneur's profile and attitudes toward the environment in which they operate, including personal experiences and the surrounding social and economic context. Such behaviors are crucial for business success, since it is the entrepreneur who makes several key decisions, ranging from the conception of the idea to the possible continuation or discontinuation of projects, including the business itself. In this context, various studies are dedicated to analyzing the characteristics that shape a successful entrepreneurial profile. One example is the study of Entrepreneurial Behavioral Characteristics (EBCs), developed by David McClelland (MSI, 1990). These EBCs are outlined and understood as follows:



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Chart 1 - Description of Entrepreneurial Behavioral Characteristics

<p>1) Seeking Opportunities and Initiative: Refers to the ability to anticipate trends and changes, proactively identifying and creating business opportunities before they become obvious to everyone.</p> <p>2) Persistence: Represents the determination to overcome challenges, applying strategic and innovative solutions to minimize failures and adapt to adversity.</p> <p>3) Demand for Quality and Efficiency: Involves a continuous commitment to excellence, seeking to improve the quality and efficiency of products, services, and processes.</p> <p>4) Independence and Self-Confidence: Highlights the entrepreneur's need to act autonomously, trusting in their skills and judgment to make decisions and face the challenges of entrepreneurship with confidence and resilience.</p> <p>5) Information Seeking: Emphasizes the importance of actively collecting and analyzing relevant data, allowing one to stay updated on market trends, innovations, and opportunities for continuous improvement.</p>	<p>6) Goal Setting: Emphasizes the need to define specific, measurable, and achievable goals, both short-term and long-term, to guide the company toward success.</p> <p>7) Systematic Planning and Monitoring: Refers to the meticulous organization and monitoring of activities, establishing deadlines and evaluating results for effective and well-founded decision-making.</p> <p>8) Risk Assessment: Deals with the ability to identify, assess, and strategically plan for potential risks, adopting measures to mitigate adverse impacts and seize opportunities disguised as challenges.</p> <p>9) Persuasion and Networking: Highlights the ability to influence and convince others, as well as build a valuable network of contacts that can be mobilized to achieve business objectives.</p> <p>10) Commitment: Demonstrates the entrepreneur's willingness to dedicate significant resources of time, energy, and capital to nurturing and developing the business, ensuring success and growth.</p>
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Source: Adapted from Krüger et al. (2017).

These characteristics can also be divided into three aspects of an entrepreneur's needs: Achievement, Planning, and Power. Achievement is composed of Opportunity Seeking and Initiative, Commitment, Persistence, Demand for Quality and Efficiency, and Risk Taking. Planning encompasses Information Seeking, Goal Setting, and Systematic Planning and Monitoring. Finally, Power involves Independence and self-confidence, as well as Persuasion and Networking.

It is crucial to understand that, although Entrepreneurial Behavioral Characteristics are often observed in successful entrepreneurs, it is not mandatory to possess all EBCs fully developed to achieve business success. Many entrepreneurs may exhibit only some of these qualities and still thrive in their ventures. Furthermore, it is important to recognize that EBCs are linked to



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human behavior, which is inherently dynamic and subject to change. Therefore, these characteristics can be developed or enhanced over time. Entrepreneurs who do not demonstrate certain EBCs can cultivate them through various forms of learning, such as mentoring, specialized courses, educational projects, and other experiences.

Just as each entrepreneur has particularities shaped by life experiences, historical context, professional background, knowledge, networks, and other factors that define characteristics adapted to the reality in which they live, businesses are no different. The characteristics that define a venture emerge from its conception through to its execution. Due to this complexity, each enterprise can be understood as a system composed of several parts, each with its own functions and responsibilities. Thus, it is essential to represent it through a model better suited to each type of business (SEBRAE, 2013). This description is provided by the Business Model, which explains the logic of value creation, delivery, and capture by an organization, with different possible configurations (PACE, 2020).

Among the possible ways of analyzing business models is the Business Model Canvas (BMC), conceived by Alexander Osterwalder, a strategic management and business planning tool used to develop and outline such models in a visual and structured manner. The BMC provides a clear and concise view of the organization, facilitating the identification of opportunities for innovation and optimization, assisting in team communication and alignment, the exploration of business ideas, and adaptation to market changes in a more agile way (SEBRAE, 2013; PEREIRA, 2016; ALMEIDA et al., 2020).

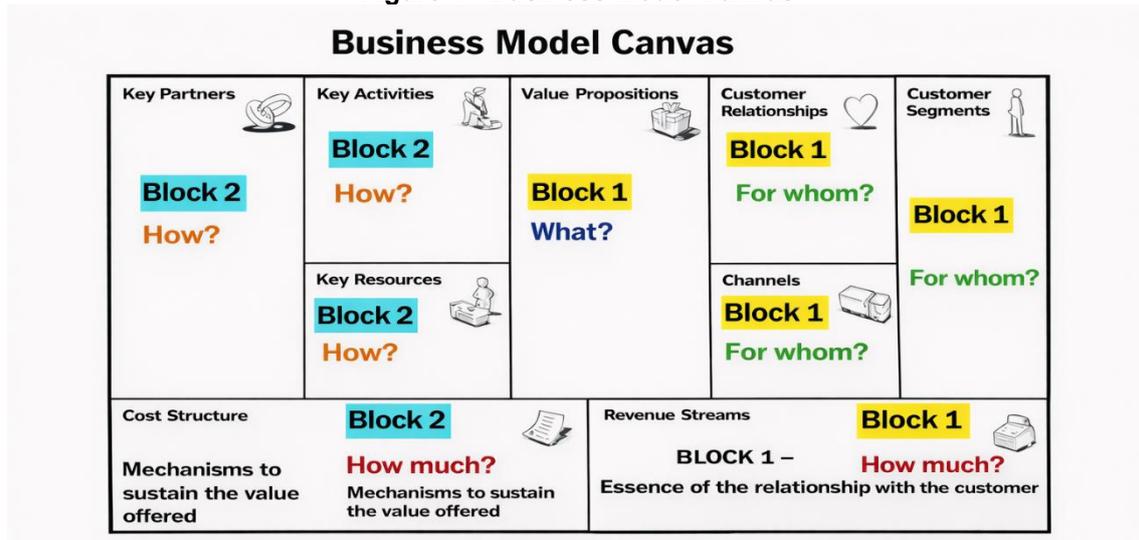
In detail, the BMC is a framework structured into two main blocks, as shown in Figure 1. Block 1 is dedicated to the value proposition and customers (Customer Segments, Value Proposition, Channels, Customer Relationships,



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and Revenue Streams). Block 2 focuses on the supporting structure of demand (Key Resources, Key Activities, Key Partnerships, and Cost Structure).

Figure 1 - Business Model Canvas



Source: Adapted from: Osterwalder; Pigneur (2011).

For an effective understanding of the BMC, it is crucial to better comprehend each of its components. As mentioned, the Value Proposition is central, standing out in Block 1 as the heart of the model, defining the differentiating factor that the organization offers to customers. This may include innovative solutions, unique benefits, or any aspect that distinguishes the venture's offering from others in the market. In addition to clarifying the value offered, it is essential to identify for whom this proposition is intended, which leads to the Customer Segments helping to define the target market, segments, and niche focuses.

The delivery of this value proposition and interaction with customers are fundamental aspects. Through Channels, we determine how delivery occurs, which may include communication, sales, distribution, and after-sales support. Customer Relationships describe how the company interacts with customers over time, aiming to establish and maintain loyalty. Revenue Streams indicate how the



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company generates income from each customer segment. This component is vital in outlining how the company captures value and is closely linked to the Value Proposition, the target audience, the channels used, and the type of relationship developed with customers.

In Block 2, which focuses on the structure required to meet demand, the Key Resources component may range from physical and intellectual assets to human and financial resources. Key Activities encompass the fundamental operations required to deliver the value proposition, such as production and marketing. Key Partners represent external alliances that complement the company's capabilities and help ensure efficiency across the value chain. As these structures and operations entail costs, the Cost Structure component provides a clear view of the expenditure necessary to keep the business running. This aspect helps ensure a comprehensive understanding of the financial investments involved and supports the optimization of resource allocation, aligning with the company's overall strategy for value creation and delivery.

In the study by Amaral and Miyatake (2023), the BMC was used to analyze the strategies of companies in the events sector in Curitiba, investigating the adaptations made to survive the challenges imposed by the COVID-19 pandemic. This represented a novel approach to applying the BMC for this purpose. The dynamics of four companies in the sector were examined, reconstructing their business models for the pre-pandemic, during-pandemic, and post-pandemic periods. This analysis revealed transformations in how these companies operated, in some cases including changes to the value proposition that remained even after the restrictions were lifted. One of the companies even served clients from other countries, such as Chile and Bolivia, via video call platforms. The interviewees indicated that these changes were driven by shifts in demand, which in turn fostered new market opportunities. However, the understanding of these changes was based on the interviewees' accounts,



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without the use of other tools to map the characteristics and behaviors of each entrepreneur.

METHODOLOGY

According to Creswell (2007), qualitative research is a methodological approach focused on gaining an in-depth understanding of social and human phenomena from the perspective of the individuals involved. This methodology is characterized by the collection of rich and detailed data, which are interpreted using techniques such as interviews, case studies, open-ended questions, and empirical investigations. Its main purpose is to understand concepts, experiences, and the meanings that subjects attribute to social and individual environments, encompassing the motivation and characterization of the object of study.

By employing investigative tools in three of the four companies cited by Amaral and Miyatake (2023), which operate in the children's party segment in Curitiba-PR, a multiple-case study approach was adopted. This methodology is appropriate when the object of investigation is broad and complex to be analyzed in a general manner, allowing the exploration of "how" and "why" certain phenomena occur (Creswell, 2007). This approach was chosen to understand the relationship between the entrepreneurs' profiles and the transformations in their business models in the pre-, during-, and post-pandemic periods.

In conducting the study, considering the specificities of the companies in the segment under analysis, a non-probabilistic sampling strategy was used, specifically convenience sampling. This method made it possible to include companies that were accessible and willing to participate in the research. This choice was motivated by procedural constraints, which limited access to only a representative subset of the total population, thus making sampling-based research feasible (Oshita, 2018).



A multiple-case analysis was conducted involving three companies in the children's party sector located in Curitiba-PR. For this purpose, the BMC was applied as described in the literature for the three periods mentioned, considering the motivations behind the modifications made in each company from the entrepreneurs' own perspectives (Amaral & Miyatake, 2023). In addition to the data collected from the literature, a specific questionnaire was administered to assess the scores related to each CCE, as indicated by Mansfield et al. (1978). This questionnaire was used to obtain the score for each entrepreneurial characteristic, adjusted by a correction factor according to Krüger et al. (2017). Subsequently, through a stratification process of CCE levels, the score and intensity present in each entrepreneur were determined, ranging from Nonexistent (less than 13) to Very High (greater than 21). For specific details regarding the questions asked, scoring, and stratification, please refer to Appendix A.

RESULTS AND DISCUSSION

The collected data were processed, and the stratified scores are presented in Chart 2. It is important to note that the same numbering used by Amaral and Miyatake (2023) was maintained, in which E1 refers to the entrepreneur of Company 1, E3 to the entrepreneur of Company 3, and E4 to the female entrepreneur responsible for Company 4. In the cited study, Company 2 is included; however, it was not possible to conduct the research with that company's entrepreneur.

An initial approach was to identify patterns by relating changes in the BMC to the entrepreneurs' CCEs. However, due to the complex nature of the ventures, the entrepreneurs themselves, and the limited number of cases studied, it was not possible to identify such patterns. As discussed throughout this section, the adopted approach was to understand the changes in the BMC through the



CCEs for each individual case. In this sense, the scores should be compared only within each entrepreneur's profile and not between different entrepreneurs.

Chart 2 - Stratified Scoring of Entrepreneurs' CCEs

Aspects	Characteristic	E1	E3	E4
Achievement (AC)	Seeking opportunities and taking initiative	Low (17)	Very Low (14)	Low (18)
	Risk assessment	High (20)	Non-existent (11)	Low (16)
	Persistence	Low (18)	Low (16)	Low (18)
	Demanding quality and efficiency	High (19)	Very Low (14)	Very High (23)
	Commitment	Very High (23)	Very Low (14)	High (21)
Planning (PL)	Information gathering	High (19)	Low (18)	Low (17)
	Goal setting	Very Low (14)	Non-existent (12)	High (21)
	Systematic planning and monitoring	Low (18)	Very Low (13)	High (19)
Power (PO)	Persuasion and networking	Very Low (14)	Low (16)	High (19)
	Independence and self-confidence	Very Low (13)	Very Low (14)	Low (17)

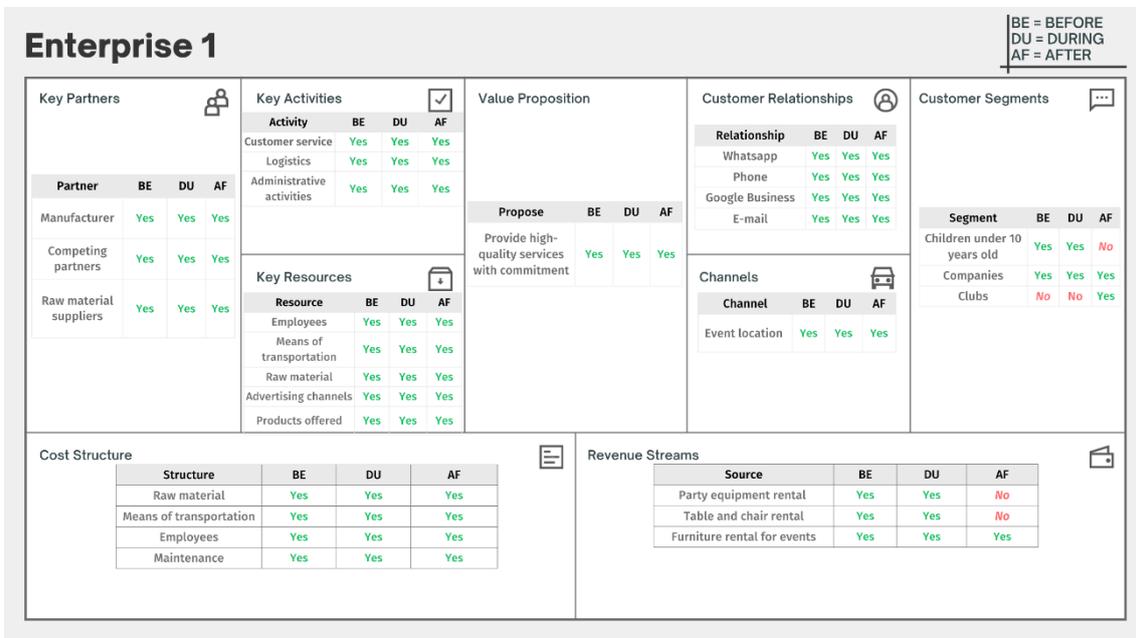
Source: elaborated by authors.

Company 1 operates in the party market in Curitiba. Initially, it started by offering toys for rent at children's parties, but modified its products after the pandemic, focusing on the rental of food carts (Figure 2).

Figure 2 – Business Model for Company 1



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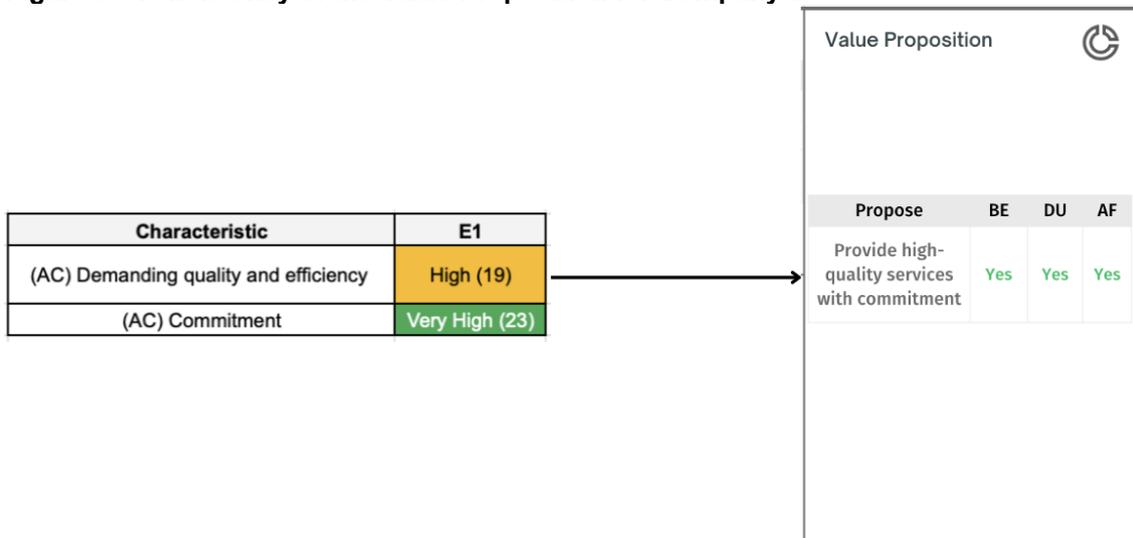
Source: Amaral; Miyatake (2023).

Although the focus is on justifying changes in the business model based on the entrepreneur's core competencies (CCEs), when analyzing E1, a key point is the consistency of the Value Proposition component connected to the Realization aspect. As can be seen in Figure 3, the demand for quality and efficiency, as well as Commitment, are two striking characteristics of this entrepreneur, which align completely with the essence of the business, given by "Delivering services with quality and commitment". This shows us that these CCEs that define entrepreneurs also define their business model.



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Figure 3 - Consistency of the Value Proposition for Company 1



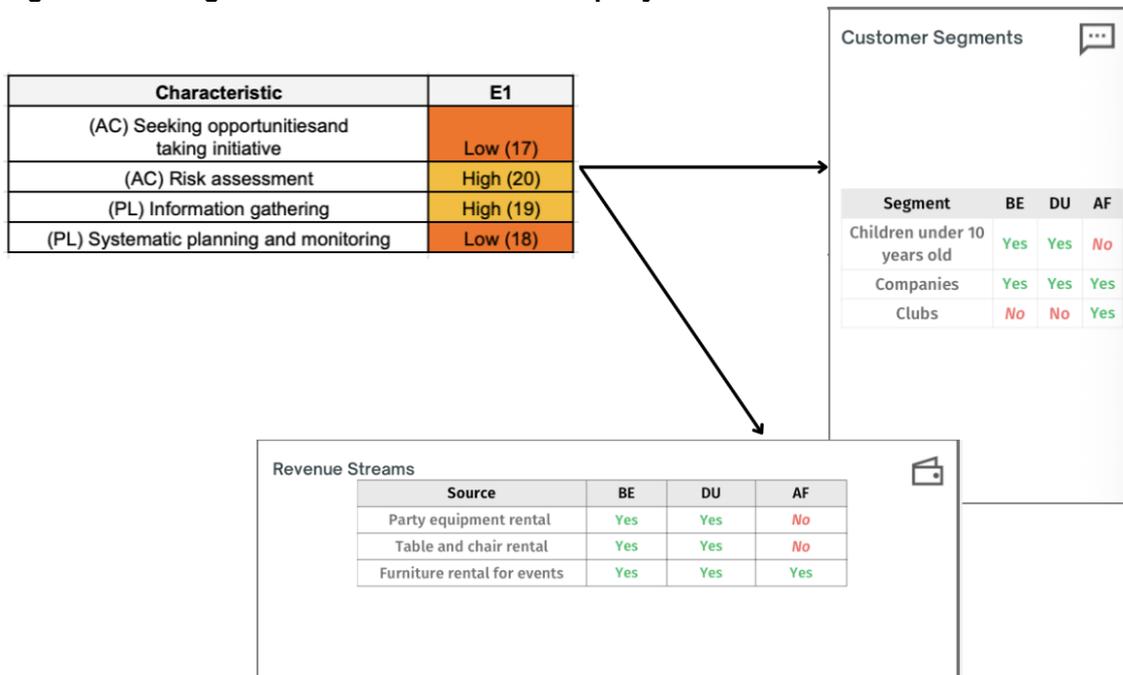
Source: Elaborated by authors.

Regarding the changes that occurred, they were due to a shift in the Customer Segment, which consequently impacted Revenue Streams. We associate these changes with the characteristics of Opportunity Seeking and Initiative, Risk Calculation, Information Seeking, and Systematic Planning and Monitoring, with the first two related to Execution and the last two to Planning, as can be seen in Figure 4. This correlation is made because the entrepreneur indicated that the change in the customer segment occurred upon perceiving an increase in demand for food carts in the business sector, demonstrating opportunity seeking and initiative. As the change in customers requires alterations in the way the business operates and the products available, it was necessary to carry out these tasks considering the associated risks and all the necessary planning and monitoring to avoid a change that is detrimental to the company. Finally, the information seeking occurred because the greater focus on food carts generated the need to expand the catalog of this type of product (AMARAL; MIYATAKE, 2023), requiring the learning of the best techniques involving these new products.



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Figure 4 – Changes in BMC and CCEs for Company 1



Source: Elaborated by authors.

Thus, we observe that the characteristics present in E1 were important in enabling him to overcome the problems caused by the pandemic, as well as to take advantage of new opportunities that emerged afterward. Although some of these characteristics have low scores, their presence can be used to justify such changes. Another important point to highlight is that this entrepreneur has a very low score in the Power dimension; therefore, the changes presented here were not related to the respective characteristics of this dimension. Thus, the changes observed in the business model are directly linked to this entrepreneur's profile. However, these connections are not trivial, and an analysis conducted together with the entrepreneur is necessary to understand how and why the change processes in the company occurred, allowing the CCEs to be correlated with the changes in the BMC.

Company 3 provides recreational activities for children through shows, magic performances, and other similar activities. The owner of this company lives



in Brazil but began his entrepreneurial career in Bolivia, his country of origin, which is an important aspect for understanding the services offered during the pandemic. It is possible to observe changes in Blocks 1 and 2, and E3 experienced changes in the BMC exclusively during the pandemic, subsequently resuming the usual in-person operations, as illustrated in Figure 5.

Figure 5 – Business Model for Company 3



Source: Amaral; Miyatake (2023).

During this exceptional period, the entrepreneur adopted an online format, offering recreational activities for children, including international audiences. This alternative was made possible because, being originally from Bolivia, he received support from his network of contacts in his home country and in Chile, where he has relatives and acquaintances, to promote his work in an online format, reaching new customers. This network was important for reaching a broader audience. As highlighted in his BMC, customers are considered partners, as they are also responsible for promoting this entrepreneur's work. In other words, his network of contacts in Brazil was also crucial for promoting his work within the country.



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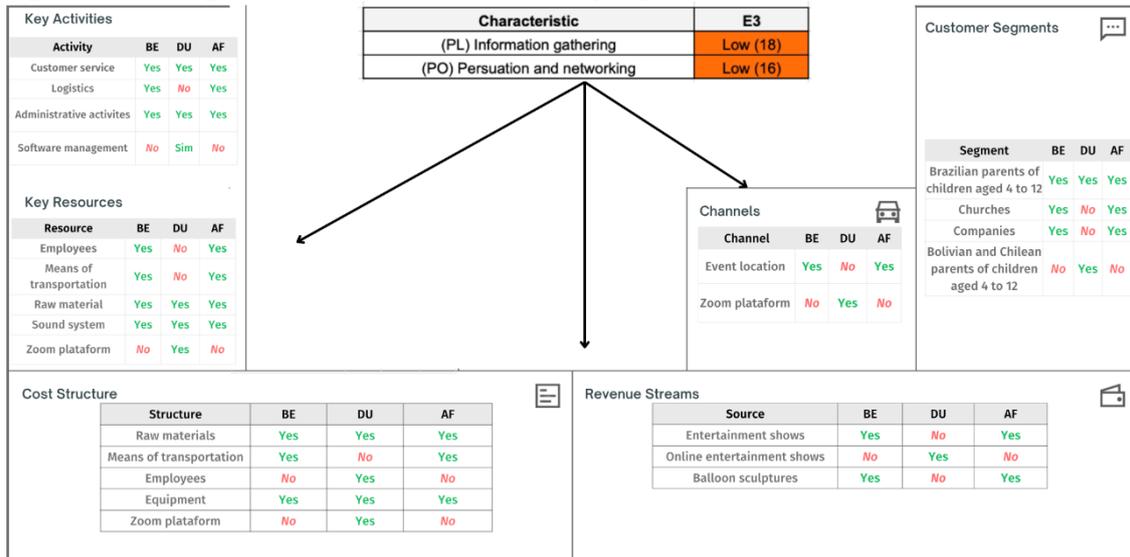
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Although the change initially occurred in the Revenue Streams component, since this entrepreneur used the new format to sustain his business, it impacted the entire BMC. However, as discussed, this change was only possible due to his network of contacts that supported the promotion of his work. For this reason, in Figure 6 we highlight the CCE of Persuasion and Networking as an important characteristic in promoting the changes observed in the BMC. Another highlighted characteristic is Information Seeking, as E3 had to learn new tools, such as the Zoom platform, in addition to acquiring knowledge about video and audio equipment to deliver his services.

Another interesting point to analyze is the overall behavior of the changes that occurred. E3 used the restructuring of his venture to survive the difficulties faced; however, after the pandemic, he did not continue with this new business format. Despite parents indicating a lack of interest in continuing online activities after the pandemic, E3 did not explore hybrid alternatives or other solutions that could have capitalized on the knowledge acquired during the crisis. This scenario is reflected in the CCE of Opportunity Seeking and Initiative, which received a very low evaluation. Thus, we see that the low presence of certain characteristics can also be responsible for changes, but not necessarily in a positive direction.



Figure 6 – Changes in BMC and CCEs for Company 3



Source: Elaborated by authors.

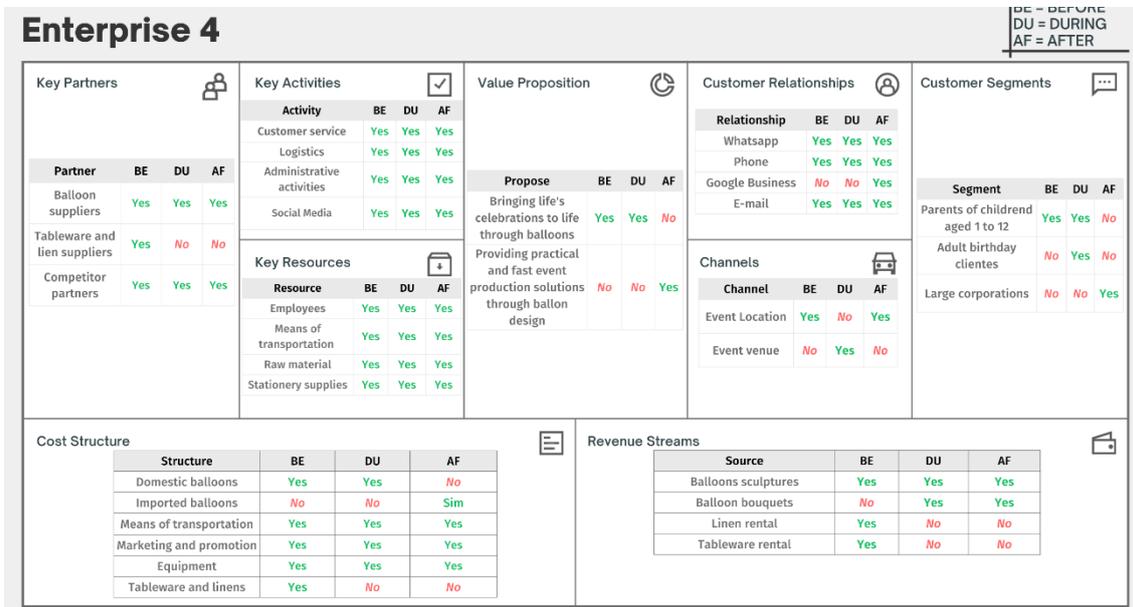
Finally, Company 4 operates in the balloon decoration sector. Initially, it focused on children’s parties and, after the pandemic, began offering services to the corporate market. E4 implemented several changes in the business model, as illustrated in Figure 7.

These changes were partially driven by a revision of the Customer Segments, redirecting the company toward more profitable markets, focusing on the corporate market rather than individual consumers. The perception of higher profitability and the emergence of this corporate demand are highlighted by the characteristics of Opportunity Seeking and Initiative and Information Seeking, which are typical of E4, as shown in Figure 8. This approach was also reflected in temporary adjustments to the BMC, such as the inclusion of adult parties in the company’s portfolio, as a strategic response to the restrictions imposed by the COVID-19 pandemic.

Figure 7 – Business Model for Company 4

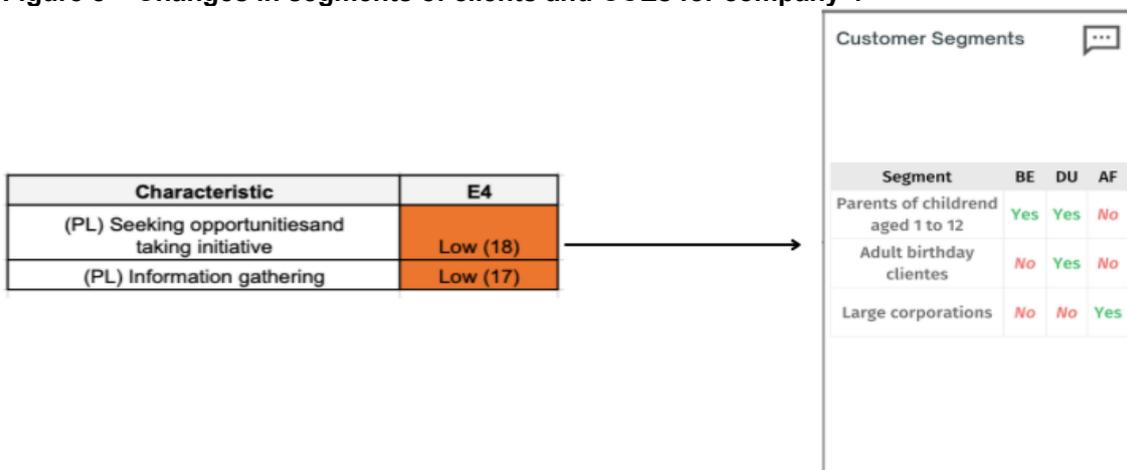


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Source: Amaral; Miyatake (2023).

Figure 8 – Changes in segments of clients and CCEs for company 4



Source: Elaborated by authors.

We also highlight the demand for quality and efficiency, evidenced by the replacement of domestic balloons with imported ones, as shown in Figure 9. According to the entrepreneur of E4, this change was made to improve the service offering, despite the consequent increase in costs. This decision reflects



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the high value placed on excellence, directly influencing the company's cost structure (AMARAL; MIYATAKE, 2023).

Figure 9 – Changes in Cost Structure and cCEs for Company 4



Source: Elaborated by authors.

The CCEs such as Goal Setting, Planning and Systematic Monitoring, together with Risk Calculation, are crucial for business sustainability in the face of the challenges imposed by restrictions. These skills enabled the entrepreneur to manage transformations effectively, balancing risks and ensuring rigorous monitoring of established goals and achieved results. In addition, the high level of commitment demonstrated by E4 is fundamental for navigating these changes, as was reflected in the company's restructuring, including its Value Proposition.

Although the entrepreneur achieved the highest score in the Power dimension, it is not clear how this aspect benefited her during the pandemic, requiring further investigation for a better understanding. In summary, the entrepreneur has a profile with a stronger presence of entrepreneurial characteristics and prefers to carry out activities with a certain degree of planning. There were changes in Blocks 1 and 2 of the BMC, reflecting a shift in both the target audience and the value proposition. She simplified revenue streams and specialized in balloons. The changes are primarily based on the Planning dimension, in which the entrepreneur scored highly in two of the three components. It is possible to infer an association between the changes in the BMC and this characteristic, since modifying a company's Value Proposition is far from simple and requires a high level of preparation associated with planning.

Therefore, we observe that the correlation between the CCEs and changes in the business model is not trivial, nor is it possible, based on our



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results, to identify consistent patterns of this correlation. This non-triviality highlights the complexity of both the entrepreneur and the enterprise. Thus, we emphasize that the correlations between these two tools - namely, Entrepreneurial Behavioral Characteristics and the Business Model Canvas - are established through an understanding of motivations, choices made, and the context in which entrepreneurs are embedded (history, place of origin, etc.) in order to implement specific changes, as illustrated in Figure 10.

Figure 10 – Relationship between CCEs and BMC



Source: Elaborated by authors.

CONCLUSIONS

The study investigated the interaction between the CCEs and changes in the BMC. The context of these changes was the response to the COVID-19 pandemic by entrepreneurs in the children's party sector in the city of Curitiba, Paraná. It was possible to analyze how the CCEs influenced the way entrepreneurs adapted and restructured their business models to face adversity or even to maintain certain components of the business model.



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The analysis revealed that changes in the BMC may be directly associated with certain entrepreneurial characteristics. For example, it was observed that both specific changes and the absence of changes in the BMC can be explained by the presence or absence of certain CCEs. However, the “connecting bridge” between these two tools lies in understanding the motivations that led entrepreneurs to take specific actions, the strategies used to do so, and the context in which these entrepreneurs are embedded. In addition, no patterns were found linking specific characteristics to particular components, highlighting the complexity of entrepreneurial behavior.

Although the analyses highlight a correlation, a more detailed and precise analysis is crucial to deeply understand the individual motivations and specific contexts that led to such adaptations. Another important step would be to increase the sample size, which would allow for further refinement of the understanding of the topic. However, methodological challenges were encountered, as many companies in the sector do not systematically document their business models and the changes that occur, making the reconstruction of the BMC for previous periods dependent on the interviewees’ memories. Constructing the BMC for a prior period is possible, but identifying the CCEs is not. This is because it would require the interviewee to assume how they would have answered the same questionnaire in an earlier period. In this sense, the results and conclusions are based on the hypothesis that the entrepreneur’s profile did not undergo significant changes during the three periods studied. Again, we are not assuming that no changes occurred, but rather that they were not substantial enough to invalidate our results.

In conclusion, as far as could be determined, this study is pioneering in applying the CCEs to analyze changes in the BMC, especially during the COVID-19 pandemic. As suggestions for future research, it is recommended to develop a map of other economic activities, as particularities may vary across sectors. It



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would be interesting to examine differences between sectors with more or less planning in business development. Other reference points, such as economic crises, market regulations, or other significant events, may also be used to structure the business model in pre-, during-, and post-event periods. Another relevant aspect is to consider differences driven by local culture, in the case of Curitiba, Paraná, as well as the education and background of the entrepreneurs studied, given the strong potential influence on the results.

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APPENDIX A - TECHNICAL DETAILS ON THE SURVEY OF CCEs

The final score for the CCEs begins with the application of the questionnaire presented in Chart 3, where the answers to these questions are quantified using a 5-point Likert scale as follows: Never (1), Rarely (2), Sometimes (3), Frequently (4), and Always (5). These values are added



together as shown in Chart 4 to obtain the score before correction, where we specify the operation that must be performed in relation to each question, plus the extra value at the end.

Chart 3 - Questionnaire on CCEs by Mansfield et al. (1987)

<p>1) I strive to accomplish the things that need to be done.</p> <p>2) When faced with a difficult problem, I take a long time to find the solution.</p> <p>3) I finish my work/activity on time.</p> <p>4) I get annoyed when things are not done properly.</p> <p>5) I prefer situations where I can control the final result as much as possible.</p> <p>6) I like to think about the future.</p> <p>7) When I start a new task or project, I gather as much information as possible before proceeding with it.</p> <p>8) I plan a large project by dividing it into simpler tasks.</p> <p>9) I can get others to support my recommendations.</p> <p>10) I am confident that I can succeed in any activity I set out to do.</p> <p>11) No matter who I'm talking to, I always listen attentively.</p> <p>12) I do things that need to be done without others having to ask me.</p> <p>13) I insist several times to get other people to do what I want.</p> <p>14) I am faithful to the promises I make.</p> <p>15) My performance at work/activities is better than that of other people I work with.</p> <p>16) I only get involved with something new after I have done everything possible to ensure its success.</p> <p>17) I find it a waste of time to worry about what I will do with my life.</p> <p>18) I seek advice from people who are experts in the field I am working in.</p> <p>19) I carefully consider the advantages and disadvantages of different alternatives before undertaking a task.</p> <p>20) I don't spend much time thinking about how I can influence other people.</p> <p>21) I change my way of thinking if others strongly disagree with my points of view.</p> <p>22) I get annoyed when I don't get what I want.</p> <p>23) I like challenges and new opportunities.</p> <p>24) When something gets in the way of what I am trying to do, I persist in my task.</p>	<p>29) I take action without wasting time searching for information.</p> <p>30) I try to take into account all the problems that may arise and anticipate what I would do if they occur.</p> <p>31) I rely on influential people to achieve my goals.</p> <p>32) When I am performing something difficult and challenging, I have confidence in its success.</p> <p>33) I have had failures in the past.</p> <p>34) I prefer to perform tasks that I master perfectly and in which I feel confident.</p> <p>35) When I encounter serious difficulties, I quickly move on to other activities.</p> <p>36) When I am doing a job for someone else, I put in extra effort, so that she is satisfied with the work.</p> <p>37) I am never truly satisfied with how things are done; I always consider that there is a better way to do them.</p> <p>38) I take on risky tasks.</p> <p>39) I have a clear life plan.</p> <p>40) When I execute a project for someone, I ask many questions to ensure I understand what they want.</p> <p>41) I address problems as they arise, instead of wasting time anticipating them.</p> <p>42) To achieve my goals, I seek solutions that benefit everyone involved in a problem.</p> <p>43) The work I do is excellent.</p> <p>44) On some occasions I have taken advantage of other people.</p> <p>45) I venture to do new things and things different from what I have done in the past.</p> <p>46) I have different ways of overcoming obstacles that arise in order to achieve my goals.</p> <p>47) My family and personal life are more important to me than the work deadlines I set for myself.</p> <p>48) I find the quickest way to finish work, both at home and at work/college.</p> <p>49) I do things that other people consider risky.</p> <p>50) I care as much about achieving my weekly goals as I do about my annual goals.</p> <p>51) I rely on various sources of information when</p>
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<p>25) If necessary, I don't mind doing other people's work to meet a deadline. 26) I get annoyed when I waste time. 27) I consider my chances of success or failure before I start acting. 28) The more specific my expectations are regarding what I want to achieve in life, the greater my chances of success.</p>	<p>seeking help to carry out tasks and projects. 52) If a particular method for dealing with a problem doesn't work, I resort to another. 53) I can get people with strong convictions and opinions to change their way of thinking. 54) I stand firm in my decisions, even when other people strongly oppose me. 55) When I don't know something, I don't hesitate to admit it.</p>
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Source: Mansfield et al., 1987.

Chart 4 - Questions and characteristics of the CCEs instrument

CCE	QUESTIONS					EXTRA
Seeking opportunities and taking initiative	+Q1	+Q12	+Q23	-Q34	+Q45	+6
Persistence	+Q2	+Q13	+Q24	-Q35	+Q46	+6
Commitment	+Q3	+Q14	+Q25	+Q36	-Q47	+6
Demanding quality and efficiency	+Q4	+Q15	+Q26	+Q37	+Q48	+0
Taking calculated risks	+Q5	+Q16	+Q27	-Q38	+Q49	+6
Setting goals	+Q6	-Q17	+Q28	+Q39	+Q50	+6
Seeking information	+Q7	+Q18	-Q29	+Q40	+Q51	+6
Systematic planning and monitoring	+Q8	+Q19	+Q30	-Q41	+Q52	+6
Persuasion and networking	+Q9	-Q20	+Q31	+Q42	+Q53	+6
Independence and self-confidence	+Q10	-Q21	+Q32	+Q43	+Q54	+6
Correction Factor	+Q11	-Q22	-Q33	-Q44	+Q55	+18

Source: adapted from Mansfield et al., 1987.

Chart 5 also includes the Correction Factor, which should be used in the final score to prevent the respondent from unintentionally presenting an excessively favorable self-image. As can be seen in Chart 5, the factor should only be used if the score is greater than 19.

Chart 5 – Correction Factor for CCEs

Total of the Correction Factor	Value to decrease
24 ou 25	7



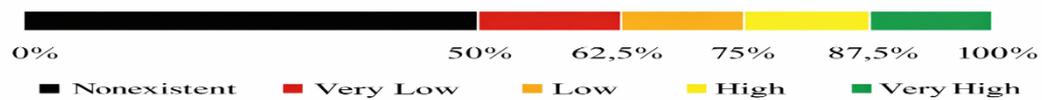
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22 ou 23	5
20 ou 21	3
19 ou menos	0

Source: Krüger et al. (2017).

To quantify the value of each characteristic, the Correction Factor is subtracted from all of them, as shown in Chart 5. The maximum score is 25, but, as indicated by Minello et al. (2017), we can stratify the total score for a better understanding, dividing it into four parts, generating a classification in levels between 0% and 100% (Figure 11).

Figure 11 – Stratification of CCEs' Levels.



Source: Minello et al. (2017).

Therefore, the results are presented both in terms of score and intensity. This stratification is important because in the version without it, the characteristic is only stated as non-existent or present, without indicating the intensity of its presence.