

Absorptive capacity in startups: Leveraging Edtech's competitive advantages during the Covid-19 pandemic



Capacidade absorptiva em *startups*: Alavancando as vantagens competitivas das Edtechs durante a pandemia da Covid-19

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Abstract

Purpose: This work investigated the contribution of the absorptive capacity of education startups (Edtechs) to the development of innovations and sustainable competitive advantages in the first year of social distancing during the Covid-19 pandemic.

Originality/value: Although absorptive capacity is considered important for innovating and obtaining competitive advantages (Cohen & Levinthal, 1990; Zahra & George, 2002), it has been little investigated in the context of startups (Cajuela & Galina, 2020). In addition, considering the current business environment of growth in the use of technologies in education, especially the adoption of remote education (Ministério da Educação [MEC], 2020) during the Covid-19 pandemic, this study seeks to contribute to the understanding of the growth of Edtechs in this scenario.

Design/methodology/approach: The research consisted of a qualitative approach, and data collection was conducted through semi-structured interviews using the Google Meet tool. The data were analyzed based on the thematic analysis by Braun and Clarke (2006, 2012), which enabled us to define codes, categories, and themes for analysis.

Findings: The results showed the relationship between the absorptive capacity of startups, the innovations developed, and the competitive advantages acquired. Interorganizational relations with corporates and interactions with specialists and mentors also evidenced the development of absorptive capacities. In addition, the internal team and the organizational culture emerged as essential sources of absorptive capacities. Thus, as recommendations for future research, it is suggested to investigate these two constructs and their relationship with the startups' absorptive capacity.

Keywords: absorptive capacity, startup, competitive advantage, Edtech, Covid-19

Resumo

Objetivo: Este trabalho investigou a contribuição da capacidade absorptiva de *startups* de educação (Edtechs) para o desenvolvimento de inovações e vantagens competitivas sustentáveis, durante o primeiro ano de distanciamento social da pandemia da Covid-19.

Originalidade/valor: Embora a capacidade absorptiva seja considerada importante para a inovação e obtenção de vantagens competitivas (Cohen & Levinthal, 1990; Zahra & George, 2002), ela tem sido pouco investigada no contexto das *startups* (Cajuela & Galina, 2020). Além disso, considerando ainda o atual ambiente de negócios de crescimento da utilização de tecnologias na educação, especialmente pela adoção do ensino remoto (Ministério da Educação [MEC], 2020) durante a pandemia da Covid-19, este estudo busca contribuir para a compreensão acerca do crescimento das Edtechs nesse cenário.

Design/metodologia/abordagem: A pesquisa foi realizada a partir de uma abordagem qualitativa, e a coleta de dados ocorreu por meio de entrevistas semiestruturadas, na ferramenta Google Meet. Adotou-se a análise temática de Braun e Clarke (2006, 2012), por meio da qual foi possível definir códigos, categorias e temas referentes aos dados.

Resultados: Os resultados evidenciaram a relação entre a capacidade absorptiva das *startups* e as inovações desenvolvidas, bem como as vantagens competitivas adquiridas. Evidenciou-se ainda o desenvolvimento das capacidades absorptivas pelas relações interorganizacionais com *corporates* e pelas interações com especialistas e mentores. Além disso, o time interno e a cultura organizacional despontaram como fontes importantes de capacidades absorptivas. Assim, como recomendações para pesquisas futuras, sugere-se a investigação desses dois construtos e sua relação com a capacidade absorptiva das *startups*.

Palavras-chave: capacidade absorptiva, *startup*, vantagem competitiva, Edtech, Covid-19

INTRODUCTION

The Covid-19 pandemic called for the practice of social distancing by people worldwide (Walker et al., 2020), causing a global reduction in the consumption of various products and services and interruption of face-to-face activities in organizations. In Brazil, it affected the “operation of millions of small businesses, convulsing entire sectors, from physical retail to food service, tourism, and entertainment, with direct impact on associated chains,” according to a report of the Inter-American Development Bank (IADB), published in September 2020 (Morelix et al., 2020, p. 6).

Also, based on data in the same IADB report, 75% of the startups in the country were adversely impacted by Covid-19, with severe effects on at least a quarter of the Brazilian universe of startups (Morelix et al., 2020). But in education, this scenario was different. The educational institutions also had to adapt to this new circumstance. They adopted emergency remote education, according to Ordinance No. 343 of March 17, 2020, of the Ministry of Education (MEC, 2020), which boosted the sector of education startups, the so-called Edtechs.

Based on a survey conducted by the Brazilian Association of Startups in partnership with the Innovation Center for Brazilian Education, in 2019, 449 Edtechs were in operation in the country (Abstartups & Cieb, 2020). This number increased during the pandemic as a result of the information and communication technologies (ICT) that were adopted in the business sector of emergency remote education (Matias, 2020), reaching 559 active Edtechs in December 2020, according to data from the *Edtech Report* published by the Distrito (2020) innovation platform.

Given this scenario, the central theme of the present study is related to the understanding of the operations of education startups during the Covid-19 quarantine period, especially those associated with the development of absorptive capacities designed to achieve a competitive advantage, development of innovations, and financial growth. As the main justification of the study, we can cite the increasing importance of using resources and technologies in education, especially in remote education, due to the social distancing measure required by the pandemic (MEC, 2020). Additionally, according to Cajuela and Galina (2020), the absorptive capacity of startups has been little addressed in the literature.

Cohen and Levinthal (1990), the first authors to develop the absorptive capacity construct, advocated its importance for developing innovative organizational capabilities. In addition, Xie et al. (2018) identified various

studies that show the importance of absorptive capacity to innovation and the increase of the bottom-line results of the organizations. In this context, Cajuela and Galina (2020, p. 553) argue that “innovation can increase the probability of survival and sustainability of the competitive advantage of a startup because it enables the creation of dynamic capabilities and improves the startup absorptive capacity.”

So, absorptive capacity, innovation, and competitive advantage are inter-related concepts. Thus, this study aims at answering the following question:

- How absorptive capacity contributed to the creation of competitive advantages and innovations in education startups (Edtechs) during the quarantine of the Covid-19 pandemic?

To this end, the scope of this work includes understanding how the startups investigated put into practice their capacity to absorb external knowledge during the pandemic in order to innovate, gain competitive advantages, and overcome the challenges imposed by social distancing.

Thus, the main objective of this study was to identify the absorptive capacity used by education startups during the Covid-19 pandemic to leverage their growth and increase innovation. The following specific objectives were defined: identifying Edtech's potential and realized absorptive capacities developed during the pandemic, and the contribution of Edtechs' absorptive capacities to their growth and innovation during the Covid-19 pandemic.

The present paper contains six sections, including this introduction. The following section describes the theoretical framework that supports the study. Section 3 describes the methodological procedures applied to answer the research question and achieve the proposed objectives. Subsequently, data are presented, as well as their analyses and conclusions.

THEORETICAL FRAMEWORK

This section describes the topics investigated in the literature, which characterize the theoretical framework of this study. Contextualization of the concept of startups' absorptive capacity is described below.

Absorptive capacity in startup organizations

Absorptive capacity was initially defined by Cohen and Levinthal (1990) as the organizations' ability to exploit outside sources of knowledge to develop innovation. The authors observe that the capacity to use external knowledge

comes from the ability to analyze and recognize the value of such knowledge and its assimilation and commercial application.

Zahra and George (2002, p. 186) define absorptive capacity as a “set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability.”

Thus, the organizational ability to absorb knowledge is important for creating value, and knowledge acquisition is the first stage of this process, followed by assimilation, transformation, and exploitation (Zahra & George, 2002; Xie et al., 2018). These four processes correspond to four dimensions of absorptive capacity and are complementary (Zahra & George, 2002).

Also, according to Freire et al. (2021, p. 45), absorptive capacity is

[...] the capacity to identify, assimilate, accommodate and balance a new internal or external knowledge, by institutionalizing it within the institutionalized scope of changes of routines and habits, to improve efficiency, competitiveness, and innovation.

Also, considering that absorptive capacity is “a dynamic capability of knowledge creation and utilization that enhances a firm’s ability to gain and sustain a competitive advantage” (Zahra & George, 2002, p. 185), the organizational ability to obtain knowledge on the external environment constitutes a source of sustainable competitive advantage for the organization (Leal-Rodríguez et al., 2013).

In this sense, potential absorptive capacity refers to acquiring and assimilating knowledge, while realized absorptive capacity deals with the transformation and incorporation of knowledge by creating sustainable competitive advantages and innovation (Zahra & George, 2002). About this, Cohen and Levinthal (1990) emphasize that the firm’s ability to find valuable information from outside sources and apply it internally is critical to its innovation process.

In the study by Xie et al. (2018), for example, they found a positive relationship between the dimensions of absorptive capacity and innovation outcomes in technology firms. Thus, it is worth noting that both incremental innovation and radical innovation can benefit from absorptive capacities. In incremental innovation, the organization implements improvements on what already exists, and in radical innovation, it develops something totally new, a breakthrough (Tidd et al., 2008).

In addition, according to Dávila et al. (2018), research studies have shown the importance of studying the absorptive capacity of innovation in developing

countries such as Brazil precisely because of the turbulent nature of these markets. In this regard, the authors found in their study with Brazilian organizations that their absorptive capacity influences innovation and that the realized absorptive capacity influences more innovation outcomes than the potential absorptive capacity.

Given that absorptive capacity is considered a dynamic capability that also influences the achievement of competitive advantages by organizations (Zahra & George, 2002), it is worth investigating its presence in startup-type firms, which typically operate in highly volatile environments, which was also seen in the business sector during the Covid-19 pandemic.

Considering the study of startups' absorptive capacity, Cajuela and Galina (2020, p. 553) mention:

The importance of building capabilities in startups is recognized in the study of Savarese, Orsi, and Belussi (2016), in which the authors show that the development of dynamic capabilities, considered by them as an investment in human resources and new routines, is significant to the growth of this kind of firm. But this topic is little studied.

According to Blank and Dorf (2014), a startup is a kind of organization with a flexible business model, which makes it repeatable and scalable. According to Ries (2012), startups operate based on developing new products and services in highly uncertain markets.

The startup development phases are ideation, validation, traction, and scale-up. In the ideation phase, the startup develops its initial business idea. During validation, the business model is formatted, with validation of the minimum viable products (MVP). The traction phase is when the startup seeks to grow in the number of clients and sales. And finally, in the scale-up phase, the focus is on growing quickly, that is, growing to become a scale-up business (Instituto Brasileiro de Governança Corporativa, 2019).

Specifically relating to education startups, a survey carried out by Abstartups and Cieb (2020) identified the main education segments of Edtechs in Brazil. They are early childhood education, primary and secondary education; higher education; corporate education; preparatory courses; language courses, and free courses. The same study also identified the digital training resources used by Edtechs, divided into software (contents, tools, and platforms), hardware, and services, as shown in Figure 1.

Figure 1

Classification according to the types of digital educational resources

Software		
Contents	Tools	Platforms
1. Digital learning object (DLO)	4. Management support tool	11. Education management system (SIG SIS)
2. Educational game	4.1. Students capture tool	12. Classroom management system
3. Online course	5. Students evaluation tool	13. Virtual learning environment (VLE)
	6. Curriculum-generating tool	14. Educational platform
	7. Authoring tool	15. Adaptative educational platform
	8. Class support tool	16. Online contents-supply platform
	9. Collaboration tool	17. Digital repository
	10. Mentoring tool	
Hardware		Services
	18. Maker tool	20. Education technology services
	19. Education hardware	

Source: Abstartups and Cieb (2020, p. 15).

It should be noted that, according to that survey, “one same Edtech may supply more than one type of educational resources and/or services, so this startup is included in more than one group of digital resources” (Abstartups & Cieb, 2020, p. 14). Thus, it is important to identify how startups operate based on the educational resources supplied in order to rank them appropriately.

When conducting a systematic literature review about startups’ absorptive capacity, Martins and Freire (2021, p. 4) identified that “the theory indicates that innovation contributes to the startups’ survival when it enables the creation of absorptive capacity”. In addition, one of the main points observed by Martins and Freire (2021, p. 4) was that

Startups’ absorptive capacity is directly linked with their capacity to learn in turbulent environments where they operate. Such learning

can occur especially from interactions with other larger and already established organizations (Moon, 2011; Perez et al., 2013; Joshi, 2018; Allmendinger & Berger, 2020; Cajuela & Galina, 2020; Steiber et al. 2021).

Therefore, the main findings of their systematic review are related to the startups' interorganizational relationships with a larger organization and the absorptive capacity contribution to the survival of startups (Martins & Freire, 2021), as shown in Table 1:

Table 1
Synthesis of the systematic review on startups' absorptive capacity

Main findings	Authors
Startups participating in startup acceleration programs emphatically develop their potential absorptive capacity based on learnings from mentor networks and interactions with corporates.	Cajuela and Galina (2020)
Realized absorptive capacity enables startups to innovate from interactions with corporates.	Cajuela and Galina (2020)
In startups, sharing knowledge with corporates is critical for the development of their absorptive capacity.	Joshi (2018)
Facilitators of knowledge sharing between startups and corporates: teams with the same goals and participants from one or more organizations.	Joshi (2018)
Inhibitors of knowledge sharing between startups and corporates: teams made up of participants from different hierarchical levels, tight deadlines, and concomitant participation of the startup in various partnerships.	Joshi (2018)
When startups and corporates have characteristics in common, this contributes to startup learning and innovation.	Perez et al. (2013)
Due to their accelerated growth, startups with up to 5 years of operation tend to offer more job openings than larger organizations.	Toole et al. (2015)
The higher the startups' absorptive capacity at their early stage, the greater the access to venture capital investment, which enhances their performance.	Jeong et al. (2020)
Crises, such as that caused by the Covid-19 pandemic, reduce opportunities for interorganizational learning between startups and other organizations.	Haneberg (2021)

Source: Elaborated by the authors based on Martins and Freire (2021).

In this sense, it is important to understand that Edtech startups used their ability to absorb outside knowledge during the social distancing period

of Covid-19 to develop innovations and how this contributed to the achievement of sustainable competitive advantages to ensure their survival.

The following section presents the methodological procedures to answer the research question and achieve this study's objectives.

METHODOLOGICAL PROCEDURES

This study was developed through exploratory, bibliographic, and descriptive research. The first step to answering the research question was finding in-depth knowledge on the issues related to startups' absorptive capacity through an exploratory and bibliographic survey.

The descriptive research, in turn, helped describe the behaviors adopted by the education startups (Edtechs) investigated during the Covid-19 pandemic to gain competitive advantages. Table 2 shows the details of the Edtechs that participated in this study.

Table 2

Characterization of the Edtechs participating in the study

Edtech	City/state	Educational segment(s) of Edtech operations	Kind(s) of technology(ies)	Startup stage	Length of time in operation
A	Santo André/SP	Preschool education; elementary and secondary education; higher education	Educational platform	Scale-up	8 years
B	Chapecó/SC	Higher education	Educational technology services	Traction	5 years
C	Florianópolis/SC	Elementary and secondary education	Student evaluation tool; educational platform	Scale-up	4 years
D	Florianópolis/SC	Corporate education	Educational technology services	Validation	1.5 year
E	Rio de Janeiro/RJ	Corporate education	Online course; educational platform; online content supply platform	Scale-up	9 years
F	Florianópolis/SC	Free courses	Online course; online content supply platform	Traction	1.5 year
G	São Paulo/SP	Elementary and secondary education	Educational platform; online content supply platform	Traction	3 years

Source: Elaborated by the authors.

The adopted approach was qualitative, seeking to know and understand the actions performed by the investigated startups based on the point of view of their managers (Creswell, 2010; Merriam, 2009). Thus, as research subjects (informers), we chose the founders/top managers of Edtech startups that had successful results in 2020, specifically during the quarantine imposed by the Covid-19 pandemic, as shown in Table 3.

Table 3
Informers of the field research

Edtech	Informer	Position	Has previous experience in startups?	Interview duration
A	1	Co-founder/CEO	No	22 minutes
B	2	Co-founder/CEO	No	19 minutes
C	3	Co-founder/COO	No	53 minutes
D	4	Co-founder/project manager	No	24 minutes
E	5	Co-founder/CEO	Yes	35 minutes
F	6	Co-founder/CEO	Yes	24 minutes
G	7	Co-founder	Yes	33 minutes

Source: Elaborated by the authors.

Data were collected through a semi-structured interview using the Google Meet video call tool. The interview followed the directions described in the collection tool used (Appendix A). The interviews were recorded using the same Google Meet tool and later transcribed into written form. To participate, the respondents signed the Informed Consent Form, which informed the nature of the study and ensured confidentiality in the treatment and presentation of data.

Analysis of the data collected was conducted using thematic analysis as proposed by Braun and Clarke (2006, 2012) and sought to identify similarities between the results in order to answer the research question. The thematic analysis was carried out in six phases, as proposed by the authors: familiarizing with the data collected, generating codes, searching for themes, reviewing potential themes, defining and naming the themes, and producing the report.

The interviews were transcribed into written form during the initial phase of familiarization with data. The data set was read in duplicate to

enable researchers to be broadly familiarized with them. During this phase, notes of initial insights were taken for further analysis. The next stage, code generation, required the researchers to resume the list of ideas generated in the previous phase to search for and produce the perceived codes (Braun & Clarke, 2006).

In the phase of searching for themes, it was necessary to begin the analysis of the codes generated as well as their combination for the definition of the categories and themes. It should be noted that the search for themes in the data set analysis aimed at identifying “some level of patterned response or meaning.” Thus, a deductive (theory-driven) approach was adopted to identify the themes in the data set by comparing it with the theoretical framework previously studied (Braun & Clarke, 2006, p. 10).

In the phase of review of potential themes, a refinement of the codes and the themes defined was conducted based on a new reading of the data set. So, it was possible to proceed to the next phase, defining and naming themes, where all of them were defined. Finally, a description of the analysis was generated from the inter-relation of the themes with the question and objectives of the research (Braun & Clarke, 2006).

The following section describes the data identified in the survey and the analysis conducted.

PRESENTATION AND DESCRIPTIVE ANALYSIS OF DATA

After data collection and analysis, it was possible to identify the themes that emerged from the data codification, as shown in Figure 2 (Appendix B). When asked whether the startups grew during the first year of social distancing caused by the Covid-19 pandemic, all participants of the survey said that they did, with increased revenues, number of clients, sales volume, and number of employees. As informer 2 pointed out, Edtechs were valued more after the pandemic.

Of the startups participating in the study, one practically doubled the number of employees, with 18 new hires; one almost tripled, with 70 new hires; one startup increased in nearly seven times its staff, with 17 hires; one increased the staff by almost 30% with a new hire, and another startup increased the staff by 15%. Only one startup informed having laid off one employee and no hires. These data corroborate startups' great offer of job openings with up to five years of activity (Toole et al., 2015). Two startups that hired new employees had more than five years of business, while three had less than five years of activity.

Regarding participation in startup support programs, three startups in this study participated in one of these programs (pre-incubation, incubation, acceleration, mentoring program, and/or open innovation) during the social distancing imposed by Covid-19. In comparison, three other startups had participated in previous years, and one never participated. Among the six firms that attended these programs, it was possible to identify the development of the potential absorptive capacity from the interactions with mentors and corporates in five of them (Joshi, 2018; Cajuela & Galina, 2020).

When investigating whether Edtechs had interorganizational relationships with any corporate during 2020, two of them had partnerships for MVP validation (one multinational and two large-sized national firms); one had several partnerships for joint product development with small and medium-sized organizations represented by specialists, one had some partnerships (which did not contribute to learning and growth of the startup during the pandemic), a large group acquired another one at the beginning of the pandemic, and two did not have relationships with corporates.

About these interorganizational relationships, four informers said they contributed in some way to the organization's growth in this period by assisting them in validating or co-developing products and services or increasing profits through investment. Here it was not possible to confirm the understanding of Haneberg (2021) that crises tend to diminish interorganizational learning by startups, considering that during the crisis caused by Covid-19, most startups reported having had interorganizational learning with corporates, mentors, or clients, with no reduction of such learnings concerning previous years.

Regarding the potential absorptive capacity, all startups said they needed to acquire new knowledge during the social distancing period in March 2020 due to the significant market uncertainties and changes. The most cited ways of acquiring knowledge were: search for expertise, access to online content, participation in online courses and lectures; participation in mentorships; creation of internal knowledge based on trial-and-error method; networking within innovation ecosystems.

As reported by informer 1,

[...] schools with agreements with hospitals like Sírío Libanês and Einstein [...] ended up transferring this knowledge to us about what needed to be accomplished [...], what they learned from experts and transferred such knowledge to us, and then the biomedical professional validated everything that we were building.

Also, informer 6 highlighted the importance of obtaining expertise and references on the themes, so experts were called to teach the knowledge that the startup was looking for.

When asked about which absorptive capacities Edtech had, the informers mentioned these: capacity to learn from clients, defining themselves as client-centered; capacity to understand and anticipate global trends; capacity to learn from the internal staff; capacity to adapt to the external environment; agility, flexibility, resilience, caution; capacity of planning and maintaining a learning and tolerant-to-error culture; continuous process improvements; leaders keeping an open mind to new learnings.

It is observed here that, considering the startups analyzed, sharing knowledge with corporates was not the main source of their absorptive capacity development, as Joshi (2018) recommended. These findings, however, corroborate the existence of potential absorptive capacity (Zahra & George, 2002). In addition, the data may provide evidence about the high absorptive capacity of the startups studied at the initial stage of development, given that this increases access to venture capital and enhances performance (Jeong et al., 2020).

This could be observed in this study, considering that of these startups, only one was at the initial validation stage. The other three startups were at the traction stage, and three were at scale-up. However, we can see that two of the startups that were in the scale-up stage had already received investment, and two that were in the traction stage had also received it during the pandemic period, as informer seven reported, which can confirm the relation proposed by Jeong et al. (2020) that absorptive capacity at the early stage of a startup favors access to investments.

When questioned about how they put into practice the acquired knowledge, the informers cited the following: co-creation of product functionalities; validation with clients through interviews and experts' support; and, finally, trial-and-error initiatives, which was the most mentioned way of practicing the knowledge acquired. One can see here the existence of realized absorptive capacity (Zahra & George, 2002).

As reported by informer 1, the co-creation of functionalities took place very close to clients:

Just to give you an idea, we developed an application for these new processes during the pandemic, and the application layout was made by students of one of our clients because they were internally designing a solution [...], and the client said: we have a supplier that does it

[...], and then we started a collaboration with them. So, it was indeed very close [to the client].

Regarding the development of innovations during the social distancing period of the Covid-19 pandemic, all startups responded that they had realized incremental or radical innovations. About such innovations, four informers said that they were developed with partners, experts, clients, or corporates. It is possible to infer the relation between the startup's realized absorptive capacity and the innovations accomplished through corporate interactions (Cajuela & Galina, 2020).

When asked about whether the startup succeeded in gaining competitive advantages and overcoming the challenges imposed by the Covid-19 pandemic, it could be noticed, based on the informers' reports, positive indications, i.e., all of them achieved competitive advantages, especially relating to identification and satisfaction of needs of potential clients; an increase of products' functionalities; methodology for agile management for the home office work model; focus on sales and networking building ability. Once again, we can see an example of realized absorptive capacity (Zahra & George, 2002).

Thus, we could see in this study the association of absorptive capacities with innovation and achievement of competitive advantages (Cohen & Levinthal, 1990), considering that the absorptive capacities used or developed during the social distancing imposed by Covid-19 pandemic supported the innovations and competitive advantages that were achieved. This is shown in informer 1's report:

What we did immediately was to begin bringing content to the schools because we did not know and did not have the content, so we started inviting people to speak with schools. And thus began a series of webinars that brought us very much closer to schools. Then, on account of this, we were able to understand better these new needs, when, I think, this advantage was created, such competitive advantage that you asked about.

This is also shown in informer 7's statement, which observed that Edtech needed to adopt a high level of flexibility due to uncertainties and constant changes in the marketplace. Therefore, the startup decided to adopt the practice of testing communication via social media and e-mail marketing, among other actions, to find the best solution for that moment.

Also showing the importance of innovation to increase the startup's absorptive capacity (Cajuela & Galina, 2020) is reported by informer 5:

When 2020 came, there were no more lectures [...] How to create a marketing strategy that would draw attention? Then I migrated to watch lives. We then became one of the first firms to implement weekly lives, and every week there was a live with HR. What did we do to attract? [...] Firstly, I began calling customers. Then I began to see which companies I wanted to approach [...] Then we closed many projects because of that too. It was something like a shot in the dark, a model that many digital influencers were doing but no company was doing. [...] So, this builds agility, error culture, and adaptability.

In addition, the development of absorptive capacity based on the organization's internal team was also observed, as informer three explained, who pointed out that creative, committed, and engaged employees were largely responsible for project development and achieving the startup's goals.

In this regard, it was also evident the importance of the organizational culture in promoting innovation and building competitive advantages. As informer 5 reported, in his startup:

Culture is essentially routine, as well as communication. We have very regular routines in our routine to ensure that we can execute them, so that's why I can see that most companies do not have such discipline. Communication then flows easily; everyone knows what is happening all the time.

This was also corroborated by informer 6, who made clear the importance of a strong and cohesive organizational culture and total transparency in communication for the success of Edtech. This also contributed to the fact that the pandemic's effects did not significantly impact Edtech.

Finally, when relating the themes to the theory, it was possible to find confirmation of the following theoretical assumptions (Table 4).

Table 4
Alignment between codes, themes, and theory

Codes	Categories	Themes	Theory	
Revenues	Increase	Growth	A great number of job openings in startups with up to five years of operation (Toole et al., 2015).	
Clients				
Sales				
Employees				
Search for clients				
Gaps in educational systems				
Scalability				
Digital				Pandemic
Face-to-face competitors disappeared				
Budget reduced				
Multinational corporate	Acquisition (mergers & acquisitions – M&A)			
Networking		Interorganizational relations	Potential absorptive capacity developed by interactions with mentors and corporates (Joshi, 2018; Cajuela & Galina, 2020).	
Mentorships				
Learnings				
MVP validation				Startup support programs
National and multinational corporates				
Joint development				
Integration of complicated systems				
Experts				
National corporates				Clients
Getting closer to clients				
Collaboration with clients				
Support/assistance to clients				
Online content (webinars/lives)				
Connection with corporates throughout the country				

(continue)

Table 4 (continuation)

Alignment between codes, themes, and theory

Codes	Categories	Themes	Theory
Valuation as a result of the pandemic	Clients	Competitive advantages	Realized absorptive capacity (Zahra & George, 2002).
Awareness of client needs			
Scenario analysis	Strategy		
Reduction of the distance between competitors			
Adaptability			
Agility	Work model		
Autonomy			
Home office culture			
Processes			
Routines			
Validation	Product		
Platform stability			
New functionalities			
Differentials			
Assistance from expert friends	Experts	Acquisition of new knowledge	Potential absorptive capacity (Zahra & George, 2002).
Market references			
Online courses	Online contents		
Online contents			
Mentorship	Startup support programs		
Events			
Lectures/conferences			
Networking with ecosystem	Internal sources		
Internal sources			
Co-creation of functionalities	Clients		
Validation			
Expertise	Experts		
Trial and error	Trial and error		

(continue)

Table 4 (conclusion)

Alignment between codes, themes, and theory

Codes	Categories	Themes	Theory
Co-creation of new functionalities with clients	Incremental	Development of innovations	Startup's realized absorptive capacity generates innovations through interaction with corporates (Cajuela & Galina, 2020).
Integration development with clients			
Process improvements			
Adaptation to distance learning			
Co-creation of new products with experts	Radical		
New products			
Co-creation of new services with corporate			
Anticipating future global trends	Management model	Absorptive capacity	Absorptive capacity, innovation, and an increase in competitive advantages are interrelated (Cohen & Levinthal, 1990). Innovation increases the startup's absorptive capacity (Cajuela & Galina, 2020). Staff learnings contribute to the development of startup capacities (Savarese et al., 2016; Cajuela & Galina, 2020). Great absorptive capacity at the initial stage increases access to venture capital, which improves performance (Jeong et al., 2020).
Process improvement			
Agility			
Adaptability			
Evolutive capacity			
Transparent communication			
Clear metrics			
Resilience			
Flexibility			
Caution			
Planning			
Learning culture	Organizational culture		
Tolerance to error			
Open mind			
Learning from staff	Staff		
Focus			
Workforce			
Client-centered	Clients		

Source: Elaborated by the authors.

Thus, it can be seen that the Edtechs studied have a broad set of potential and realized absorptive capacities and succeeded in using them during the social distancing period of the Covid-19 pandemic to develop innovations and gain competitive advantages. The following section presents a discussion on data analysis.

DISCUSSION

Based on data analysis, it was possible to characterize the contribution of absorptive capacities to the growth of the Edtechs studied during the Covid-19 pandemic, considering that most of them achieved expressive economic and organizational growth in this period, both in revenue and the number of clients and employees.

In the present survey, it was also possible to notice the development of innovations, both incremental and radical. Incremental innovations were achieved with new functionalities created jointly with clients, the development of integrations with clients, the improvement of organizational processes, and Edtech's adaptation for distance education. Radical innovations also occurred from the co-creation of new products with experts, the co-creation of new services with associate corporates, and the creation of new products by the startups.

These innovations enabled to build of competitive advantages, especially regarding clients, strategy, work model, and product. About clients, getting closer to them, collaborating with them, identifying their needs, connecting, supporting, and assisting them made a difference in the startups, also contributing to a higher valuation of the business by these clients. Regarding strategy, the ability to analyze scenarios and reduce the distance between competitors (provided by remote activities) was also a contributing factor. Thus, the work model was characterized by adaptability, agility, home office culture validation, and focus on processes and routines. Finally, the product offered differentials, such as new functionalities and higher platform stability, compared to competitors.

The potential absorptive capacity consisted of acquiring and assimilating new knowledge by interacting with specialists, online content consumption, participating in startup support programs, and interacting with internal development sources, especially related to teamwork and organizational culture. In addition, the potential absorptive capacity was also developed using interorganizational relations with business partners, clients, business associates (acquisitions), and startup support programs.

Realized absorptive capacity, in turn, included transforming and implementing new knowledge resulting from the joint creation of functionalities, validation of solutions and functionalities with clients, and experts' contributions. It could also be seen in applying new knowledge from trial-and-error initiatives that most startups studied used.

So, in general, it was possible to identify absorptive capacities related to the startups' management model, their organizational culture, staff capabilities, and relationship with clients. Regarding the management model, the startups reported absorptive capacities relating to anticipating future world trends, process improvements, agility, adaptability, constant evolution, transparent communication, adoption of clear metrics, resilience, flexibility, careful actions, and planning.

Next, we present the conclusions of the study.

CONCLUSIONS AND RECOMMENDATIONS

This study provided a better understanding of the absorptive capacity of startup organizations, especially those with activities in education (Edtechs). When seeking to answer the initial question of the study, it was possible to notice a clear relationship between the absorptive capacities reported by the participants and the innovation and competitive advantages obtained through the acquisition and assimilation of knowledge (potential absorptive capacity) and the transformation and implementation of this new knowledge (realized absorptive capacity) during the Covid-19 pandemic.

Thus, as main contributions to the theory, this survey described the startups' potential and realized absorptive capacities developed during the Covid-19 pandemic. In addition, the development of absorptive capacities could also be seen based on the interaction of startups with corporates and mentors, not only with them. At that time, we also observed the development of absorptive capacity provided by the organizational culture and internal staff. It is worth noting, however, that the evidence of competitive advantages was found only in the informers' reports, which is a limitation of this study.

About the relationship of absorptive capacities with organizational culture, we noticed the existence of a learning culture in the startups studied, with tolerance to error, open mind to new ideas, and learning encouragement by top managers. It could also be seen that Edtechs' absorptive capacity was developed by the internal team, especially because of their continuous

learning, with a constant focus on the organizational goals, and because of their work strength and capacity. Finally, the absorptive capacity was also characterized by clients-centered management, demands, and needs.

Thus, it is essential to understand how teams are formed and managed, the distinctive attributes of the organizational culture in startups, and its relation with the growth and development of this kind of organization. So, in future studies, we recommend investigating the role of work teams and organizational culture in startups, also considering their relation with the leaders' part, especially regarding the application of absorptive capacities for developing innovations and achieving sustainable competitive advantages.

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