

Repositório ISCTE-IUL

Deposited in *Repositório ISCTE-IUL*:

2024-02-20

Deposited version:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Crespo, N., Simões, N. & Dosumu, O. (2024). Re-thinking human capital acquisition for entrepreneurship: A holistic multidimensional approach. *International Journal of Education Economics and Development*. 15 (1-2), 6-13

Further information on publisher's website:

10.1504/IJEED.2024.136200

Publisher's copyright statement:

This is the peer reviewed version of the following article: Crespo, N., Simões, N. & Dosumu, O. (2024). Re-thinking human capital acquisition for entrepreneurship: A holistic multidimensional approach. *International Journal of Education Economics and Development*. 15 (1-2), 6-13, which has been published in final form at <https://dx.doi.org/10.1504/IJEED.2024.136200>. This article may be used for non-commercial purposes in accordance with the Publisher's Terms and Conditions for self-archiving.

Use policy

Creative Commons CC BY 4.0

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a link is made to the metadata record in the Repository
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Re-thinking human capital acquisition for entrepreneurship: A holistic multidimensional approach

Otitooluwa Dosumu¹, Nadia Simoes^{2,*}, and Nuno Crespo³

¹ Iscte - Instituto Universitário de Lisboa, Business Research Unit (BRU - Iscte), Lisboa, 1649-026 Lisboa, Portugal; Otitooluwa.Dosumu@iscte-iul.pt

² Iscte - Instituto Universitário de Lisboa, ISCTE Business School Economics Department, Business Research Unit (BRU - Iscte), Lisboa, 1649-026 Lisboa, Portugal; nadia.simo@iscte-iul.pt

³ Iscte - Instituto Universitário de Lisboa, ISCTE Business School Economics Department, Business Research Unit (BRU - Iscte), Lisboa, 1649-026 Lisboa, Portugal; nuno.crespo@iscte-iul.pt

* Correspondence: nadia.simo@iscte-iul.pt

Biographical statements

Otitooluwa Dosumu: Expert on venture deals, startups and other topics related to entrepreneurship. Student of the PhD in Economics at ISCTE – University Institute of Lisbon.

Nadia Simoes: Associate Professor (ISCTE – University Institute of Lisbon). Director of the Bachelor Degree in Economics. She has published paper articles in several journals such as Economics Letters, Journal of Economic Surveys, Empirical Economics, Acta Oeconomica, International Review of Applied Economics, Telecommunications Policy, Panoeconomicus, International Journal of Social Economics, Economics Bulletin, among others. Member of the Editorial Board of the several indexed SCOPUS and Web of Science journals.

Nuno Crespo: Associate Professor with Habilitation (ISCTE – University Institute of Lisbon). Director of the Master in Business Economics and Competition. He has published paper articles in several journals such as World Economy, World Development, Economics Letters, Review of World Economics, Journal of Common Market Studies, Journal of Economic Surveys, Empirical Economics, Papers in Regional Science, Tourism Analysis, Journal of Economics and Social Measurement, Telecommunications Policy, Journal of Informetrics, Scientometrics, International Review of Applied Economics, International Journal of Social Economics. Member of the Editorial Board of the several indexed SCOPUS and Web of Science journals.

A holistic multidimensional approach

Abstract:

Given the substantial interest around the study of entrepreneurship, understanding the intricate network of factors that explain the decisions about human capital is of critical importance. Decisions concerning knowledge, skills and abilities are multidimensional since there are many modes, categories, and components of human capital acquisition. Human capital may come from a set of choices or a set of processes. The choices and processes are disaggregated into four categories: (i) what human capital entrepreneurs choose to acquire; (ii) where they want to acquire such human capital; (iii) how they want to acquire the human capital; (iv) when they want to acquire human capital. Furthermore, it is also important to understand the drivers/motivations of entrepreneurs regarding human capital acquisition. This paper is an in-depth organization and review of the existing literature. We present a roadmap connecting the points that remain disperse and fragmented. In addition, suggestions for future research are provided.

Keywords: Entrepreneurship, human capital; learning; choices; investment; knowledge;

JEL Codes: J24, L26

1. Introduction

1.1 Background

For over a decade the human capital entrepreneurship literature (HCEL) has benefited from multi-disciplinary and multi-theoretical approaches. However, the contribution of economic theory to human capital entrepreneurship literature is much scarcer (Marvel et al., 2016; Dimov, 2017). In a critical review of HCEL, Marvel et al. (2016) show that articles using economic theory account for no more than 5.6%, and that there are considerable gaps in research on how entrepreneurs acquire human capital for entrepreneurship and what motivates them to acquire specific types of human capital (Marvel et al., 2016; Dimov, 2017; Arshed et al., 2021). These research gaps deserve to be addressed for two main reasons. First, understanding how entrepreneurs acquire human capital for entrepreneurship provides useful insights on how entrepreneurs recognize opportunities in new circumstances, or how they cope/adapt to liabilities of newness (Alvarez and Barney, 2007; Marvel, 2013). This is especially important because knowledge, skills, and abilities (KSAs) may be critical in one period but irrelevant in another one. The COVID-19 pandemic is a perfect example of how circumstances can change dramatically, relegating some KSAs to the sideline (World Bank, 2020).

Second, motivation pushes entrepreneurs to take entrepreneurial actions (including acquiring more human capital) and these actions may greatly affect firm growth (Locke, 2000; Marvel et al., 2016; Vaz, 2021).

The challenge with studying how entrepreneurs acquire human capital – human capital acquisition for entrepreneurship (HCaqE) – is that there are different perspectives about this topic. A first view understands human capital acquisition for entrepreneurship to be synonymous with human capital investment (HCI). In this perspective it is assumed that some entrepreneurial KSAs are innate to the “choice” of human capital investment that entrepreneurs make, which is not always the case. This is because some KSAs may not be a direct outcome of a specific human capital investment, as a variety of factors (e.g., personal traits) also contribute to the development of these outcomes. For this reason several empirical studies advocate using outcomes of human capital investment as direct measures of entrepreneurial KSAs instead of human capital investment variables themselves (e.g., Moog, 2002; Unger et al., 2011; Marvel et al., 2016). A different way of perceiving HCaqE is viewing it as a “continuous process” of entrepreneurial learning as opposed to the static view of human capital investment (e.g., Minniti and Bygrave, 2001; Politis, 2005; Wang and Chugh, 2014).

With these two approaches in mind, the HCaqE literature suggests that human capital acquisition can be represented as either a set of “choices” or a set of “processes”, but not both. Studies on this topic therefore usually follow one of these two lines of reasoning. Also, the trend found in scientific research toward the specialization of knowledge aggravates this conceptualization because each study usually fails to show that there are several dimensions overlapping in each context. For example, in addition to choosing human capital investments, entrepreneurs also have to make choices on the content of their learning, as well as on how much effort they want to put into learning a specific content. Therefore, it seems clear that the literature on human capital acquisition for entrepreneurship has a very limited vision. In order to understand how entrepreneurs acquire human capital and what motivates them to acquire specific portfolios of KSAs, it is therefore vital to re-think the concept by moving toward a more holistic and multidimensional perspective.

1.2 Objectives

The main goal of this study is to review the empirical and theoretical literature that identifies the different concepts (and consequently components) of human capital acquisition for entrepreneurship. Based on this review, we propose a new multidimensional framework that brings together the “choices” entrepreneurs have to make and the “processes” they have to go through in order to reach a given level of KSAs. This framework is based on four questions that summarize the scope of decision required at the individual level. Entrepreneurs must choose: (i) *what* human capital they want to acquire; (ii) *where* they want to acquire that human capital; (iii) *how* they acquire the human capital; and (iv) *when* they want to acquire human capital.

Another goal of this research is to understand *why* entrepreneurs want to acquire human capital. More specifically, we focus on entrepreneurial motivation (EM) as a critical driver for human capital acquisition for entrepreneurship. While some authors argue that the relationship between entrepreneurial motivation and firm growth is significant, others find that this relationship is less critical than other factors of firm growth. Considering these findings, we provide a survey of the literature regarding the link between EM and its relationship with HCaqE.

This study extends the literature on the determinant factors of firm growth by elaborating on the idiosyncratic factors of entrepreneurs (Vaz, 2021). This is important because not all of the variables identified in the empirical literature of firm growth are direct factors, but instead have underlying variables that also influence growth. Therefore, the re-conceptualization of human capital acquisition for entrepreneurship and its drivers may lead us to expand the set of variables considered when studying this topic.

1.3 Methodology

A survey of the empirical and theoretical literature on human capital acquisition and its drivers was used to build this paper. In August 2021, a search was conducted in the Scopus Database using the terms “human capital acquisition”, “knowledge acquisition and entrepreneurship”, “knowledge and skill acquisition”, “entrepreneurial learning”, and “entrepreneurial motivation”. The search parameters were set to find these terms in the Title, Abstract, and/or Keywords of documents in the Scopus Database. A list of 1,448 publications including journal articles, books, theses, and conference papers was obtained from the first search. The breakdown of the overall results is the following: (i) “human capital acquisition” was found in 105 publications; (ii) “knowledge acquisition and entrepreneurship” in 93 publications; (iii) “knowledge and skill acquisition” in 223 publications; (iv) “entrepreneurial learning” in 615 publications, and (v) “entrepreneurial motivation” in 412 publications.

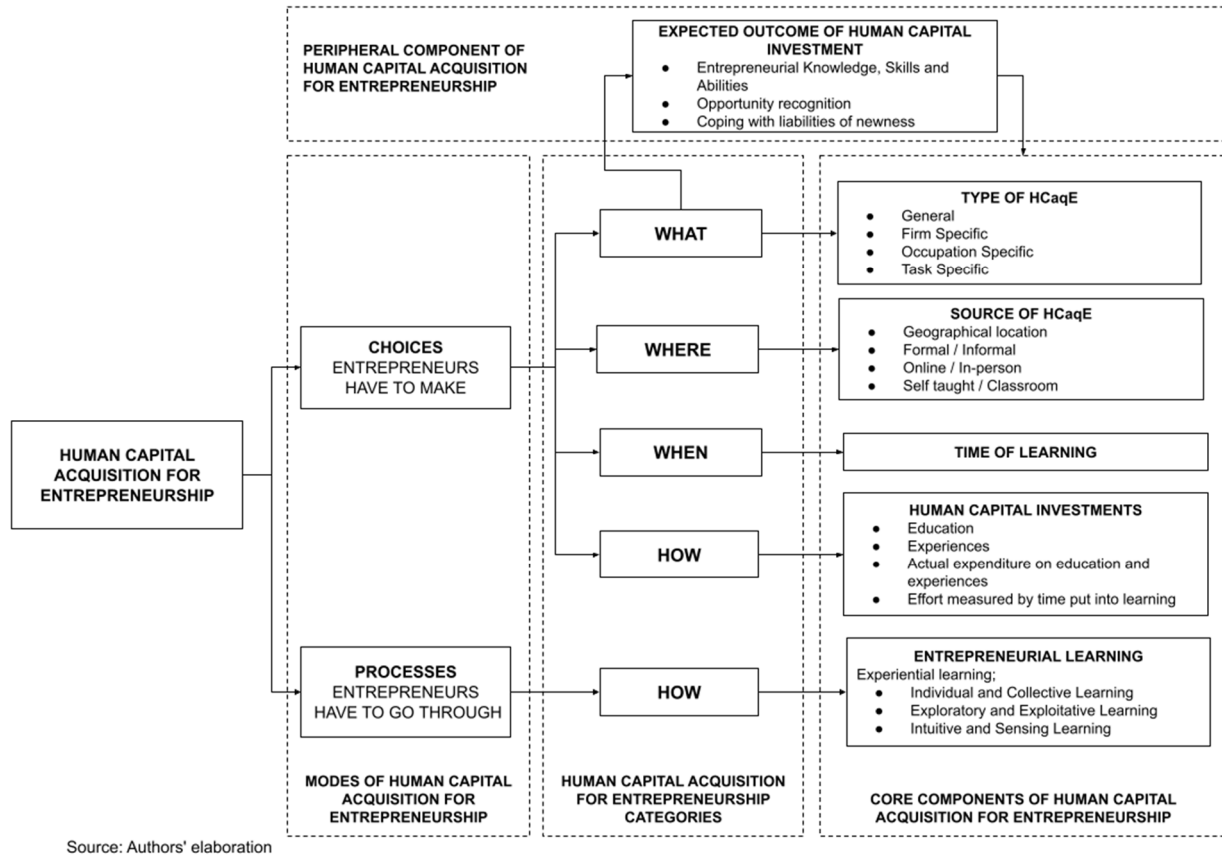
Following this search we applied a hierarchical screening procedure to decide which studies to include in the review. In the first step we adjusted the search parameters by filtering according to “subject area”. We excluded publications with subject areas from Life Sciences, Engineering, Computer Science, Arts, and Psychology. With this procedure we retained 902 publications. The results of the first step are as follows: (i) “human capital acquisition” generated 82 publications; (ii) “knowledge acquisition and entrepreneurship” generated 41 publications; (iii) “knowledge and skill acquisition” generated 50 publications; (iv) “entrepreneurial learning” generated 449 publications; and (v) “entrepreneurial motivation” generated 280 publications. In the second step we excluded all studies that were not directly related to the subject area of Economics, Econometrics, and Finance, by filtering further by subject area. This step led to a shorter list, with 363 publications. The results of the second step are as follows: (i) “human capital acquisition” generated 70 publications; (ii) “knowledge acquisition and entrepreneurship” generated 18 publications; (iii)

“knowledge and skill acquisition” generated 4 publications; (iv) “entrepreneurial learning” generated 139 publications, and (v) “entrepreneurial motivation” generated 132 publications. As a final step we identified publications that directly discussed concepts of human capital acquisition and entrepreneurial motivation. We accomplished this by reviewing the abstract of each publication generated from the second step and excluding publications for which human capital acquisition and entrepreneurial motivation seemed not to be the main topic. We arrived at a final list of 120 publications.

2. Human capital acquisition for entrepreneurship as a holistic multi-dimensional construct

Figure 1 illustrates a holistic multidimensional view of human capital acquisition for entrepreneurship, including the modes, categories, and components of human capital acquisition. The literature on HCqE shows that human capital may come from: (i) a set of choices that entrepreneurs make; or (ii) a set of processes they go through. These choices and processes are disaggregated into four major categories: (i) *what* human capital entrepreneurs choose to acquire; (ii) *where* they want to acquire that human capital; (iii) *how* they want to acquire the human capital; and (iv) *when* they want to acquire human capital. Based on this categorization, HCqE can be perceived as having five core components and one peripheral component: (i) type of human capital acquisition for entrepreneurship; (ii) human capital investments; (iii) sources of human capital acquisition for entrepreneurship; (iv) entrepreneurial learning; (v) time of learning; and (vi) expected outcomes of human capital acquisition for entrepreneurship (as the peripheral component) (Figure 1). This framework will be explored in detail below.

Figure 1: A Holistic and Multidimensional View of Human Capital Acquisition for Entrepreneurship



2.1 Core components of human capital acquisition for entrepreneurship

2.1.1 Types of human capital acquisition for entrepreneurship

Several studies suggest that human capital acquisition can be categorized into different types based on the relevance of the human capital directly related to an industry, firm, or task. The two major types of human capital acquisition commonly described in literature are:

- (i) General human capital: this includes knowledge, skills, and abilities that are equally valued across firms, industries, or occupations (Gibbons and Waldman, 1999; Ost, 2014; Kinsler and Pavan, 2015).
- (ii) Specific human capital: this refers to knowledge, skills, and abilities that are relevant to a firm, industry, or task (Gibbons and Waldman, 2004). Specific human capital can be further subcategorized into firm-specific (Lazear, 2009), occupation-specific (Neal, 1995; Sullivan, 2010), and task-specific (i.e., process specific and/or content specific) (Gibbons and Waldman, 2004).

The expected return determines the type of human capital that the entrepreneur chooses. For example, if entrepreneurs perceive that a specific human capital will generate a given level of return, this will dictate the amount of investments they will make to acquire that human capital. Many studies that compare the effects of the two types of human capital show that specific human capital leads to higher productivity or entrepreneurial success than general human capital (Gibbons and Waldman, 1999; Gibbons and Waldman, 2006; Unger et al., 2011). This is because human capital can only lead to entrepreneurial success if it is successfully transferred or applied to a specific task that needs to be done. The successful application of human capital is easier if the human capital is related to a firm, industry, process, or task (Unger et al., 2011). Some studies show that entrepreneurs with specific human capital (in particular, task-specific human capital) had better knowledge of their customers, products, and services, implying that they were more likely to succeed in their businesses (Gimeno et al., 1997).

2.1.2 Human capital investments

From a theoretical point of view, knowledge, skills, and abilities are the result of investments in human capital, such as education, training, and work experience (for seminal contributions on this topic, see Schultz, 1961; Becker, 1964; Blundell et al., 1999). For this reason, most researchers have relied on human capital investments as a proxy of human capital acquisition (Reuber and Fischer, 1994). However, human capital investment is an indirect indicator of human capital and may not always lead to the acquisition of a specific knowledge, skill, or ability. For example, two individuals with the same experience and education can have different entrepreneurial outcomes based on the knowledge, skills, and abilities they have acquired (Quiñones et al., 1995). This is because there are a variety of other factors such as the environment (e.g., learning environment or available resources) that also influence whether human capital investments will lead to the effective acquisition of KSAs (Reuber and Fischer, 1994; Quiñones et al., 1995; Paulsen, 2001; Coleman and DeLeire, 2003). Moreover, there are several individual characteristics that may affect how experience and education are transformed into relevant KSAs (Keith and Frese, 2005). These variables may include individuals' cognitive capabilities, their understanding of ideas and situations (i.e., reflective orientation), and/or personal motivations. Hence, experience or education should not be expected to be the same as knowledge, skills, and abilities acquired (Sonnenberg, 1998).

Entrepreneurs choose the type of investment they want to make to acquire human capital. They choose the type of education, training, or work experience they believe will give them the knowledge, skills, and abilities they want. Similarly, they choose the level of investment they want to make to acquire human capital. The level of investment goes beyond the idea of financial cost, and also includes the opportunity cost or amount of effort (often measured by time) required to obtain knowledge, skill, and ability.

2.1.3 Sources of human capital acquisition for entrepreneurship

Knowledge, skills, and abilities are “containers of entrepreneurial information” that can be found in a variety of places (Cooper et al., 1995; Varis and Littunen, 2010). Entrepreneurs thus have to search for the location(s) of these and determine which of these sources are best suited for their needs. The concept of sources of human capital has been widely used in macroeconomics, with several studies describing it as human capital investments (Garavan et al., 2001; Oketch, 2006; O'Mahony, 2012). A criticism of this perspective is that it does not differentiate among the factors, namely the environment in which these containers of entrepreneurial information exist. Hence it downplays the role of the location or context in which knowledge, skills, and abilities can be explored.

It is important to take a different approach to understanding sources of HCqE because in addition to deciding on human capital investments, entrepreneurs are also making decisions on their environment and format of learning. By viewing KSAs as containers of entrepreneurial information it becomes clear that they can be encountered in a variety of environments and formats. These are described as follows:

- (i) *Offline and online environments* (Roper, 2007; Littenberg-Tobias and Reich, 2020). Offline environments are the physical or geographical locations where a training or experience occurs or is domiciled (e.g., continent, country, city, neighborhood, building, classroom, etc.). Online environments, on the other hand, refers to digital/virtual environments where training or experiences occur or are domiciled (e.g., internet, educational software, teleworking, etc.).
- (ii) *Formal and informal environments* (Folkestad, 2006; Salas-Velasco, 2007). Formal environments are those in which entrepreneurial information is distributed in a structured manner, while informal environments are unplanned and allow for a flexible distribution of information.
- (iii) *Self-learning and collective environments* (Dabbagh and Kitsantas, 2012). Self-learning environments allow for individuals to transform education or experiences without external support, while collective learning environments create circumstances under which individuals learn in groups or with the inputs of other individuals.

These sources of HCqE are not mutually exclusive. Entrepreneurs can choose a combination of these sources to acquire the knowledge, skills, and abilities they need. For example, an entrepreneur may choose an environment that is online, formal, and resorts to self-learning, while another may choose an environment that is offline, informal, and benefits from collective learning. The variations of the source of HCqE appear to be limitless.

2.1.4 Time of learning

Although human capital acquisition is often viewed in the literature as a static process (i.e., void of the impact of time), there are several studies that show otherwise and that adopt an intertemporal framework (e.g., Swanson and Kopecky, 1999; Cervellati and Sunde, 2005; Wang and Zatzick, 2019). Swanson and Kopecky (1999) and Cervellati and Sunde (2005) show that the level of human capital acquisition achieved is determined by time or the duration of the lifespan of the individual. These studies show that if individuals have more time available they tend to invest more in learning. Moreover, according to Chaudhuri and Sethi (2008, p. 580), “the treatment that individuals anticipate in the labor market does influence their perceived benefits of acquiring human capital”. This could imply that individuals may determine if and probably when they would acquire human capital based on their perceived view and assessment of the labor market.

The labor mobility literature also adds to the research on this question. According to Dolton and Kidd (1998), individuals scan job opportunities, and based on this scan determine if they would invest in acquiring human capital for a given period in order to obtain benefits of a career change (which could also imply a change toward entrepreneurship).

Using a different angle of analysis, Wang and Zatzick (2019) argue that innovation is influenced by the decisions of firms regarding the moment/time they choose to acquire more and new human capital. They find that “organizations benefit from hiring evenly over time, as it ensures a continuous inflow of new knowledge and perspectives and enhances collaboration between new and incumbent employees” (Wang and Zatzick, 2019, p. 30). The idea of “*learning by hiring*” is implicit in this argument (Nahapiet and Ghoshal, 1998).

2.1.5 Entrepreneurial learning (EL)

One of the major perspectives within entrepreneurial learning research suggests that learning is experiential (Rae, 2000; Minniti and Bygrave, 2001; Sarasvathy, 2001; Corbett et al., 2007; Dimov, 2007). In more specific terms, this experiential learning is described in a variety of concepts including *learning-by-doing* (Balasubramanian 2011), *learning from success and failure* (Minniti and Bygrave, 2001), *learning from past business and life experiences* (Sardana and Scott-Kemmis, 2010), and *learning vicariously through the experiences of others* (Lévesque et al., 2009). Despite the theoretical depth of entrepreneurial learning research, a common flaw of these theories is that it is presumed that entrepreneurial knowledge is innate to the experience, which might not always be the case. Another criticism of the majority of the research on entrepreneurial learning is the assumption that experience automatically leads to the acquisition of entrepreneurial knowledge. Reuber and Fischer (1994) suggest that a distinction between the entrepreneurial knowledge acquired and the entrepreneurs’ experience is needed to properly understand entrepreneurial

learning. Taking a step forward, Politis (2005) proposes a well-known conceptual framework about this topic based on the following reasoning: “in addition to investigating the direct link between entrepreneurs’ career experiences and the development of entrepreneurial knowledge, we also need a better understanding of how the entrepreneurs’ predominant mode of transforming an experience into knowledge influences the specific type of knowledge developed, and, additionally, also the factors that influence the entrepreneurs’ predominant mode of transforming an experience into knowledge” (Politis, 2005, p. 401). These arguments present a cycle of entrepreneurial learning in which something has to be done to convert experiences to knowledge (Rae and Carswell, 2001; Politis, 2005).

2.1.5.1 Modes of Entrepreneurial Learning

The modes of entrepreneurial learning refer to the process of transforming experience into knowledge. The literature suggests that there are three distinct pathway pairs:

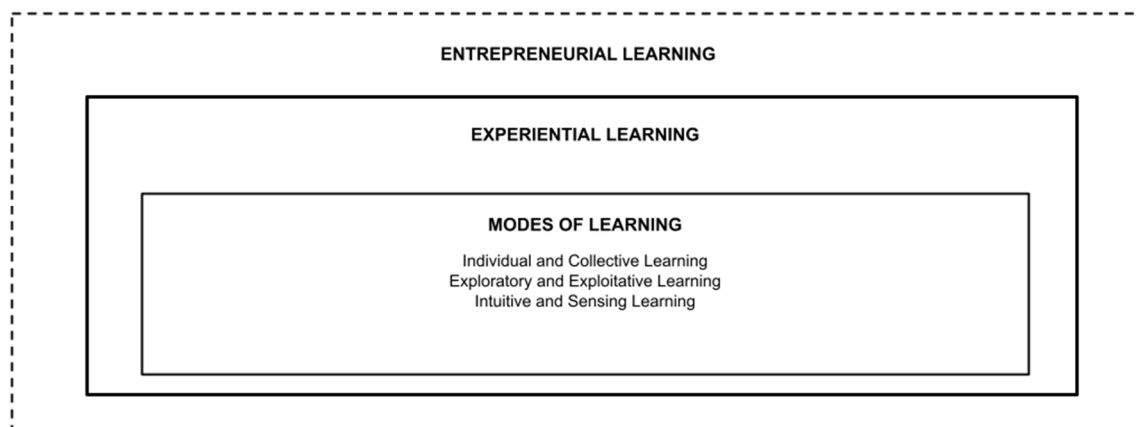
- (i) *Individual and collective learning.* Wang and Chugh (2014, p. 34) define individual learning as “the process in which individuals acquire data, information, skill or knowledge”, while Capello (1999, p. 354) defines collective learning as a “social process of cumulative knowledge, based on a set of shared rules and procedures which allow individuals to coordinate their actions in search for problem solutions”. What differentiates these two types of learning is that collective learning is cumulative, interactive, and public in nature (Hayes and Allinson, 1998; Capello, 1999; Fenwick, 2008). This characteristic enables the transmission of temporal and spatial knowledge (Andreu and Sieber, 1999; Capello, 1999).
- (ii) *Exploratory and exploitative learning.* Politis (2005) describes exploratory learning as “learning from experiences by exploring new possibilities including issues such as variation, experimentation, discovery, and innovation” (Politis, 2005, p. 408), and exploitative learning as being related to learning from experience by exploiting previous certainties, convictions, or validations (Politis, 2005). Exploratory learning is also known as variance-seeking learning or experimental learning and often develops new knowledge that influences entrepreneurs to make certain decisions (e.g., decisions to pivot their business model) (Zhao et al., 2011; Bingham and Davis, 2012). On the other hand, exploitative learning is also known as acquisitive learning and often comes from gathering and incorporating existing knowledge (Brady and Davies, 2004; Zhao et al., 2011; Bingham and Davis, 2012).

Some studies have sought to link these two types of learning with entrepreneurial outcomes. McGrath (2001), for example, suggests that exploratory learning increases performance variance, which implies large variations between success and failures, while exploitative learning improves mean performance, which may imply suboptimal stable equilibrium. March (1991, p.

71) suggests that exploration involves “search, variation, risk taking, experimentation, play, flexibility, and discovery,” while exploitation involves “refinement, choice, production, efficiency, selection, implementation, and execution”. Politis (2005) argues that although these learning processes have implications on entrepreneurs’ behaviors or strategic decisions, one process is not better than the other. In the same vein, March (1991) and Sirén et al. (2012) suggest that there are benefits emerging from a balanced mix of exploratory and exploitative learning, as choosing one process exclusively over the other has negative implications. For example, an entrepreneur who is totally focused on exploration may have many new ideas that are underdeveloped due in part to the inability to develop expertise relevant for each idea, while a total focus on exploitation may lead to being trapped in a stable equilibrium that is suboptimal (Kim and Atuahene-Gima, 2010).

- (iii) *Intuitive and Sensing Learning*. Felder and Silverman (1988) describe sensing learning as learning by the knowledge of facts, which involves an entrepreneur’s observation (i.e., through the five senses) of his/her environment, while intuitive learning refers to learning by “knowing relationships of facts” (Wang and Chugh, 2014). This entrepreneurial learning mode originates from theories in the field of psychology (Jung, 1971), and finds relevance in education research (Wang and Chugh, 2014). Due to the presumed objectivity of sensory learners, it is argued that they are more prone to discover opportunities based on observable information from the environment (Baldwin and Sabry, 2003; West et al., 2007). On the other hand, intuitive learners tend to be abstract thinkers, and are thus able to create opportunities based on their ability to connect the dots between observable data points (Cook et al., 2009).

Figure 2: A View of the Entrepreneurial Learning Process



Source: Authors' elaboration

2.2 Peripheral component of human capital acquisition for entrepreneurship

The process of acquiring knowledge, skills, and abilities requires a clear distinction between human capital investments, outcomes of human capital investments, and expected outcomes of human capital investments (Reuber and Fischer, 1994; Unger et al., 2011). Outcomes of human capital investments are considered direct indicators of human capital. Several studies have shown that outcomes of human capital investments have a greater impact on entrepreneurial success than human capital investment indicators (Crook et al., 2011; Martin et al., 2013).

Since human capital investment is not a direct predictor of a specific outcome, individuals can know the outcome of an investment only after they have made the investment. As a result, individuals have to make assumptions and form expectations in order to make choices. For instance, an individual can decide to invest in a training program with the hope of achieving a specific outcome (e.g., knowledge for starting a business, business management skills, etc.), but cannot be certain that he/she will attain this desired outcome until the training is over. They will therefore choose to invest based on the expectation that they will receive the outcomes of their investments. Because there are no guarantees that individuals will receive these outcomes, they have at best a variety of mechanisms that validate their expectations and that can be used to support their decisions. These validation mechanisms could include track record of education program, feedback from the market, prior experience, etc.

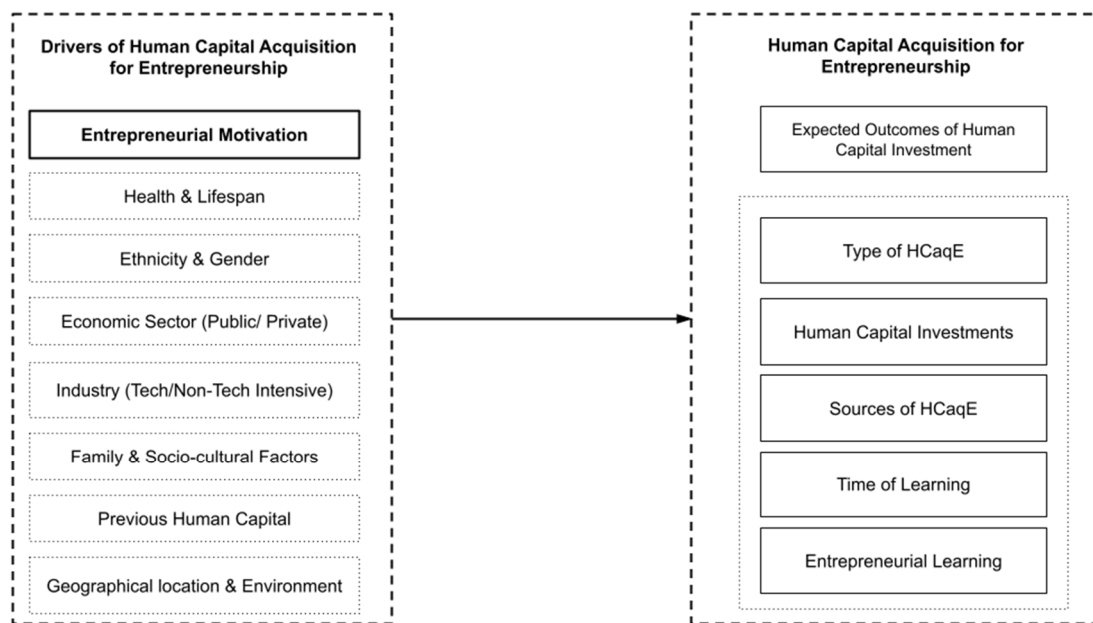
In conclusion, individuals often choose investments based on expected outcomes (Jacobs, 2007; Wiswall and Zafar, 2021). These outcomes can include future labor income, additional job features, marriage prospects, family wellbeing, knowledge on fundraising, and business management skills, among others. Because expected outcomes of human capital investments are not actual outcomes of human capital investments, there are possible/probable gaps between expected outcomes (*ex ante*) and actual outcomes (*ex post*) of human capital investments.

According to our holistic multidimensional framework for human capital acquisition for entrepreneurship we have positioned expected outcomes of human capital investments as a peripheral component (Figure 1). This is because even though individuals make a choice on what outcome they want to have, their expectations of these outcomes influences or informs other decisions about the type of human capital, source of human capital, time of learning, human capital investments, and entrepreneurial learning (Figure 1). Hence, the expected outcome of human capital investments could be seen as the first decision that entrepreneurs have to make, which then influences other choices and processes relevant for acquiring human capital for entrepreneurship.

3. Drivers of human capital acquisition for entrepreneurship

There are multiple determinant factors of entrepreneurs' decisions to acquire human capital (Figure 3). The list of key drivers includes ethnicity and gender (Chaudhuri and Sethi, 2008), previous human capital (Corbett et al., 2007; Marvel et al., 2016), health and lifespan (Swanson and Kopecky, 1999; Cohen-Cole, 2006), economic sector (De Fraja, 2008), industry (Zábojník and Bernhardt, 2001), geographical location and environment (Cohen-Cole, 2006), family and socio-cultural factors (Jayawarna et al., 2014), and entrepreneurial motivation (Arocena and Villanueva, 2003). However, substantial research gaps remain regarding the link between entrepreneurial motivation and human capital acquisition for entrepreneurship (Marvel et al., 2016). Therefore, the main goal of this section is to provide a better understanding of EM and its relationship with HCqE.

Figure 3: Drivers of Human Capital Acquisition for Entrepreneurship

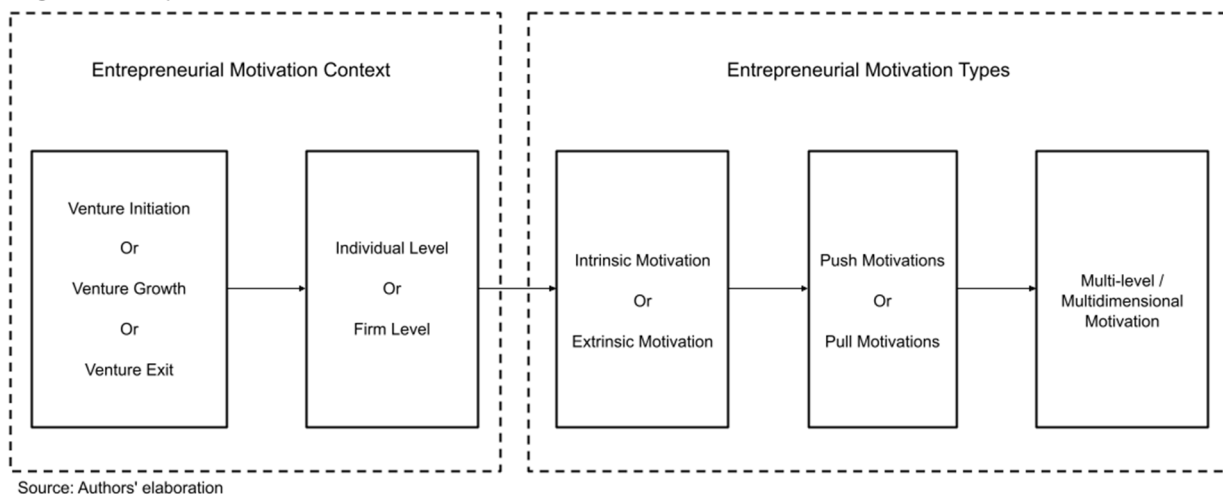


Source: Authors' elaboration

Motivation is defined as the “set of energetic forces that originate within as well as beyond individuals to initiate behavior and determine its form, direction, intensity, and duration” (Murnieks et al., 2020, p. 115). Another definition, advanced by Stephan et al. (2015), describes motivation as “the entrepreneur’s willingness to expend effort to achieve certain goals that are important to him/her” (Stephan et al., 2015, p. 41). Following these definitions, motivation influences how people behave and how much of a particular behavior they exhibit. Motivation has been studied as a core theme in the domains of psychological science and organizational behavior for many years (Shane et al., 2003; Murnieks et al., 2020). However, during

this period several subdomains have emerged discussing motivation theories in specific contexts. One of the most important contexts in this regard is entrepreneurship, linking motivation to behaviors of starting, growing, and exiting a venture (Robichaud et al., 2001; Shane et al., 2003; Murnieks et al., 2020). From this literature, it is clear that the concept of EM is dynamic and can be fully understood only by using a multidimensional and contextual lens. Figure 4 illustrates the main categories or perspectives used by the main scientific contributions in this field of study. As seen below, it is interesting that although these perspectives of motivation differ, they often have similarities, some of which characterize them as subsets of the other.

Figure 4: Entrepreneurial Motivation as a Holistic and Multidimensional Process



3.1 Entrepreneurial motivation types

3.1.1 Internal and external motivations

Internal and external motivations are the broadest perspective in the entrepreneurial motivation literature. In fact, other entrepreneurial motivation perspectives can, in some sense, be seen as extensions or subsets of this perspective. External motivations refer to forces that stem from the environment or the circumstances of the entrepreneur or the firm. Economic incentives and social equity are examples of external motivations (Renko, 2013). Among all external motivations, financial/economic incentives have received great attention, especially in the economic, management, and finance literature (Shane et al., 2003; Renko et al., 2012; Dobryagina, 2020). Internal motivations, on the other hand, refer to forces that originate from the entrepreneur, such as his/her emotions, which could consist of his/her passions or fears (Morgan and Sisak, 2016), identity (Farmer et al., 2011), and value system (Weber et al., 2008). Internal motivations are a core

topic in the field of psychology, while external motivations have deeper roots in economics, management, and related areas of study. Nevertheless, the consideration of internal and external motivations as separate areas of study can be misleading, given that entrepreneurial motivation research suggests that both motives influence entrepreneurial behavior (Powell and Baker, 2014).

3.1.2 Push and pull motivations

Push and pull motivations (also known as necessity and opportunity motivations) can be viewed as a sub-perspective of the internal and external motivation perspective because it is often based on the entrepreneur's environment and circumstances. Push motivations are considered as "necessity" motivations, which refer to negative motivations that influence a person to start, grow, and exit a venture (Turnbull and Uysal, 1995; Baloglu and Uysal, 1996; Dawson and Henley, 2012). On the other hand, pull motivations are considered "opportunity" motivations, referring to positive motivations that influence a person to become an entrepreneur (Turnbull and Uysal, 1995; Dawson and Henley, 2012; Györi et al., 2019).

The push versus pull concept of motivation is not only the earliest but also the predominant conceptualization of entrepreneurial motivation (Dawson and Henley, 2012; Stephan et al., 2015; Murnieks et al., 2020). In their review of the literature on entrepreneurial motivation, Stephan et al. (2015) report that 65% of all studies focus on the push versus pull dichotomy of motivation. A major reason for this observation is the relative ease of accessing large population-representative surveys (e.g., Global Entrepreneurship Monitor (GEM) Survey) that include push and pull motivation questions (Bosma, 2013; Hechavarria and Ingram, 2014). However, relying on these types of surveys has limitations regarding the capture of complexities of entrepreneurial motivation due to constraint in the surveys' responses.

3.1.3 Multilevel / multidimensional motivations

With the aim of overcoming the limitations of the push versus pull motivation conceptualization, several studies provide an alternative (and more detailed) perspective, using multidimensional or multilevel approaches that combine micro-perspectives. This approach is more adequate to capture entrepreneurial motivations (Robichaud et al., 2001; Shane et al., 2003; Stephan et al., 2015; Murnieks et al., 2020), and usually relies on factor analysis techniques (Morales-Gualdrón et al., 2009).

Let us briefly explore the most common dimensions included in the multidimensional approach.

- (i) *Need for achievement and learning.* This dimension refers to an individual's desire to attain significant accomplishments, high standards, or to overcome some challenges (Shane et al.,

2003; Edelman et al., 2010; Jayawarna et al., 2011; Stephan et al., 2015). This dimension shares some similarities with the need to follow role models.

- (ii) *Need for independence and autonomy.* This dimension refers to an individual's desire to be in control of their work, time, and decisions. It also refers to the desire for flexibility in managing their work life balance (Shane et al., 2003; Edelman et al., 2010; Giacomini et al., 2011; Friedman et al., 2012).
- (iii) *Need for income security and financial success.* This dimension is often assumed to be the primary motivation for entrepreneurship, namely in the area of Economics. It captures the desire to benefit from the financial incentives obtained from participating in entrepreneurship (Shane, 2003; Edelman et al., 2010; Giacomini et al., 2011; Friedman et al., 2012).
- (iv) *Need for recognition and status.* This dimension refers to an individual's desire to receive acknowledgement, respect, and/or validation within social constructs such as friends, family, and community (Shane et al., 2003; Morales-Gualdrón et al., 2009; Edelman et al., 2010; Giacomini et al., 2011; Friedman et al., 2012).
- (v) *Need for social and community improvement.* This dimension refers to the desire to solve socio-economic and environmental challenges within the entrepreneur's community (Levie and Hart, 2011; Jayawarna et al., 2011; Estrin et al., 2013).
- (vi) *Growth motivations or need for company/firm growth.* This dimension refers to the entrepreneur's desire to increase the size of his/her business in terms of number of employees and sales (Robichaud et al., 2001; Morales-Gualdrón et al., 2009; Stephan et al., 2015).

3.2 Entrepreneurial motivation contexts

The perspectives explored in Section 3.1 (i.e., internal and external; push and pull; multidimensional motivations) provide a great deal of insight about entrepreneurial motivation. However, in a recent systematic literature review on this topic, Murnieks et al. (2020) argue that entrepreneurial motivation should not be studied in generic terms but instead in the context of three entrepreneurial phases: (i) venture initiation; (ii) venture growth; and (iii) venture exit. Although most literature focuses on the first of these stages (venture initiation), there are clear differences of entrepreneurial motivation in each entrepreneurial phase (Table 1). As suggested by several authors, these differences are accentuated by differences in their antecedents, mediators, moderators, and outcomes (Morales-Gualdrón et al., 2009; Mahto and McDowell, 2018; Murnieks et al., 2020).

Table 1: Differences in antecedents, mediators, moderators, and outcomes of entrepreneurial motivation in each entrepreneurial phase

	Antecedents	Mediators	Moderators	Outcomes
Venture Initiation	● ethnicity ● personal circumstances ● fear of failure ● self-efficacy ● goal commitment ● entrepreneurial passion	● self-efficacy ● affective commitment ● bricolage	● prior startup experience ● aspiration level ● economic turbulence ● income loss ● gender ● access to resources ● aspiration level	● start venture ● discovery behavior ● opportunity recognition ● exploitation behavior ● opportunity evaluation
Venture Growth	● self-efficacy ● entrepreneurial passion ● tenacity ● identity centrality ● legacy	● positive effect ● goal clarity ● goal commitment ● goal challenge ● grit ● locomotion ● assessment	● self-control ● risk taking climate ● cognitive style ● personality ● regulatory focus ● age ● entrepreneurial experience	● venture growth ● firm performance ● team performance ● persistence ● venture funding potential
Venture Exit	● task conflict ● goal conflict		● goals ● firm performance	● sell venture ● shut down venture ● stewardship exit ● persistence with failing firm

Source: Murnieks et al. (2020, p. 130)

Beyond the study of entrepreneurial motivation within the context of entrepreneurial phases, entrepreneurial motivation has been studied using different lenses. In this case, two areas of interest seem to emerge: (i) the individual; and (ii) firm/team (Vijaya and Kamalanabhan, 1998; Stephan et al., 2015; Chedli and Kchaich, 2016; Murnieks et al., 2020).

Studies of entrepreneurial motivation at the individual level seek to understand the individual motivations and the strategic decisions and behaviors (Malebana, 2014; Stephan et al., 2015; Farhangmehr et al., 2016). On the other hand, studies at the firm/team level focus on the motivations of firms as a whole and not as an aggregation of individual motivations and behaviors (Chedli and Kchaich, 2016).

Entrepreneurial motivation at the individual level has been the major focus of most entrepreneurial motivation literature for a variety of reasons, including the fact that it is easier to gain access to individual data than to firm data. In many cases researchers argue that individual motivations can be taken as representative of firm/team level motivations. Nevertheless, since individuals are not homogeneous there might be some level of inaccuracy emerging from this assumption, especially if individual entrepreneurial motivations are grouped together to represent a single unit such as a team or firm (Stephan et al., 2015; Murnieks et al., 2020).

3.3 Linking entrepreneurial motivations

Studying each entrepreneurial motivation perspective or dimension independently can be misleading since current research suggests that motivations interact with one another to influence entrepreneurial behavior (Powell and Baker, 2014). For instance, several studies explore the links/interactions between growth motivations and other motivations. Levie and Autio (2013) show that need for financial success or wealth-seeking motivations are linked to growth motivations, while need for independence motivations are not linked. This observation was contrary to the findings of a report by the Center for High-Impact Entrepreneurship (2011), which suggest that there is a positive relationship between the need for independence motivations and growth ambitions in high-income countries. Moreover, Reynolds and Curtin (2008) show that there is a negative relationship between growth ambitions and necessity or push motivations, while observing positive relationships between growth motivations and opportunity or pull motivations.

Kuhn and Galloway (2015) suggest that internal and external motivations drive venture initiation, but also have joint implications on venture performance. They show that business performance was higher when internal and external motives were combined than when business performance stems from internal motives alone (Kuhn and Galloway, 2015). On the other hand, Cruz and Justo (2017) and Westhead and Wright (1998) find that the combination of internal (e.g., passion), economic (e.g., need for financial success), and fear of failure motives can lead entrepreneurs to participate in portfolio entrepreneurship, in which they own multiple businesses at the same time.

Despite the diverse conclusions regarding the interactions between motivations, these linkages are nonetheless vital in impacting entrepreneurial behavior. These studies therefore show that each motivation may be dependent on other motivations and that these dependencies should be considered to paint a less fragmented picture between entrepreneurial motivation and behavior.

4. Linking entrepreneurial motivation and human capital acquisition for entrepreneurship

The most prevalent link between entrepreneurial motivation and human capital acquisition for entrepreneurship in the field of Economics is the link between need for income security and financial success (or financial motivations) and acquiring education and/or new experiences (Robichaud, 2001; Shane et al., 2003; Edelman et al., 2010; Giacomini et al., 2011; Friedman et al., 2012; Murnieks et al., 2020). Several empirical studies suggest that economic agents acquire knowledge, skills, and abilities based on the expected financial return of acquiring those KSAs (Robichaud, 2001; Shane et al., 2003; Murnieks et al., 2020). In particular, financial motives seem to have strong implications on the type of HCacqE (i.e., general, firm

specific, occupational specific, and task specific) that agents choose to acquire (Dolton and Kidd, 1998; Gibbons and Waldman, 1999; Robichaud, 2001; Shane et al., 2003; Gibbons and Waldman, 2006; Edelman et al., 2010; Unger et al., 2011; Giacomini et al., 2011; Friedman et al., 2012; Murnieks et al., 2020). Similarly, financial motivations determine not only what an individual learns but also the timing of learning (Swanson and Kopecky, 1999; Wang and Zatzick, 2019). Economic agents receive signals from the labor market (e.g., income levels associated with different occupational pathways), which influence when to acquire KSAs. Moreover, motivations help agents to rank or determine which KSAs are the most important to them. Having information on which KSAs are expected to give them the highest economic reward provides agents the incentives to choose what KSAs they opt to acquire.

Politis (2005) suggests that entrepreneurs' career orientation (or direction), which is a function of their motivations, affects entrepreneurial learning, or in other words, the mode of transforming their experience to knowledge. One justification for this reasoning is that entrepreneurs are not homogenous. They have different characteristics and career motivations (Rosa, 1998; Westhead and Wright, 1998), which may influence them to seek out different entrepreneurial experiences and learning processes (Ronstadt, 1988; Minniti and Bygrave, 2001). Further justification for this argument is advanced by Block and Sandner (2009), who classify entrepreneurial motivation based on career history recorded in the German Socio-Economic Panel Study (GSOEP). Entrepreneurs who left paid jobs on their own initiative are classified as being opportunity entrepreneurs (i.e., having pull motivations), whereas entrepreneurs who were dismissed are classified as necessity entrepreneurs (i.e., having push motivations).

Following these arguments, Brousseau et al. (1996) developed a model that identified four career orientations with different underlying motivations. The key implication of this model is that we can predict that entrepreneurs or individuals who differ in terms of career orientation also differ in work and career related motivations (Brousseau et al., 1996). Let us discuss each of these career orientations:

- (i) *Linear career.* This pathway is characterized by infrequent but progressively upward hierarchical movements (e.g., managerial hierarchy) in a career field (Buzzanell and Goldzwig, 1991; Larsson et al., 2001; Baruch, 2004). Entrepreneurs with this career orientation are motivated by opportunities to accomplish important things, implying that personal wealth is not their main driver. They are usually driven by the need for achievement and satisfaction. Politis (2005) suggests that entrepreneurs with this career orientation skew toward exploitative learning processes.
- (ii) *Expert career.* This career orientation is characterized by an entrepreneur's lifelong commitment to further develop and refine their knowledge within a specific area (Politis, 2005). They are presumed to have underlying motivations of need for achievement and/or need for recognition and are more likely to exploit preexisting knowledge (Molander, 1993).
- (iii) *Spiral career.* This career orientation is characterized by periodic and significant changes across disciplines that are strongly related. This implies that they are influenced by knowledge from

previous roles to develop new knowledge in new roles (Larsson et al., 2001). Entrepreneurs with this career orientation are motivated by creativity and personal development and are inclined toward exploratory processes.

- (iv) *Transitory career.* This career orientation is characterized by frequent changes between unrelated fields, roles, and organizations. Brousseau et al. (1996) suggest that individuals with this type of career orientation are motivated by the need for independence. This type of entrepreneur is more likely to use exploratory mechanisms to acquire entrepreneurial knowledge (MacMillan, 1986; Westhead and Wright, 1998; McGrath, 1999).

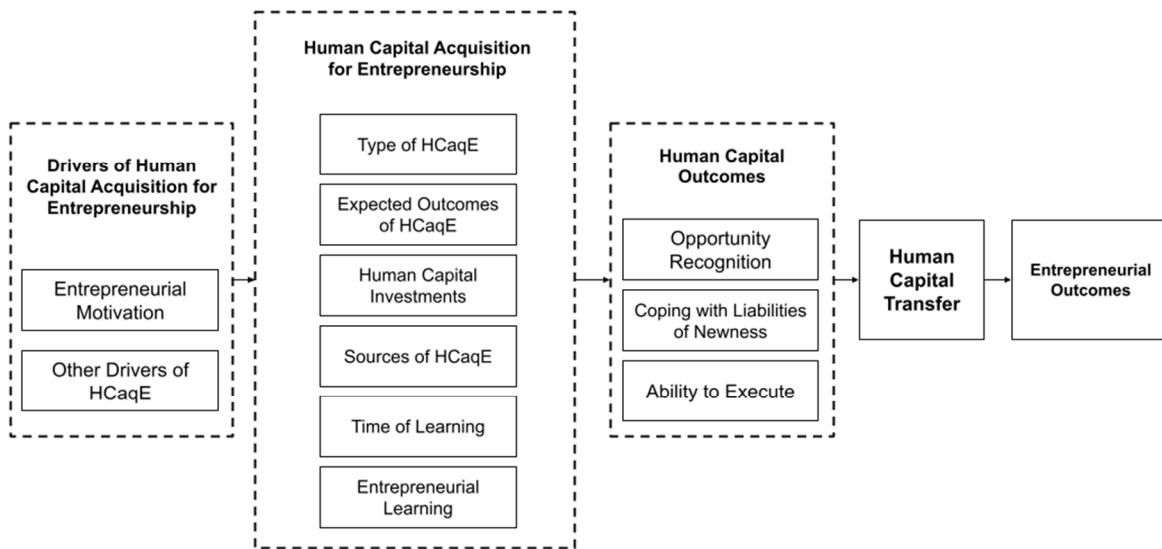
5. Conclusion

The survey on the human capital acquisition for entrepreneurship literature developed in this study provides a deeper understanding of the process that transforms experiences and education into entrepreneurial knowledge, skills, and abilities. This literature helps us to re-think current conceptualizations of human capital acquisition, leading to a new definition of human capital acquisition for entrepreneurship (HCaqE).

We can define HCaqE as the choices and processes that entrepreneurs must make and go through (at a certain period and circumstance) that lead to the assimilation of entrepreneurial knowledge, skills, and abilities relevant to that period or circumstance. This definition represents a holistic view of HCaqE, which takes into consideration the different components that make up human capital acquisition. It shows that HCaqE depends on the choices that entrepreneurs make to acquire certain KSAs. It also highlights that it is a process and that in some way entrepreneurs must go through all the “steps” to acquire certain KSAs. Moreover, this emphasizes that HCaqE is contextual and temporal and should be viewed as such because since KSAs often change due to circumstances, the choices entrepreneurs must make are expected to change too. This is particularly important in the different entrepreneurial phases. For example, studies have shown that KSAs needed in the venture initiation phase might not be the ones needed at the venture growth or exit phase. Therefore, entrepreneurs have to make new choices on what KSAs they need in each phase. They also would likely go through different processes to acquire the KSAs they need in order to perform optimally at a particular entrepreneurial phase.

This study creates new opportunities for empirical research as it emphasizes variables (such as time of learning) that have been ignored due to their implicit nature. The re-conceptualization of the HCaqE also presents the bigger picture of how human capital impacts firm growth or venture performance (Figure 5).

Figure 5 How Entrepreneurial Motivation and Human Capital Acquisition for Entrepreneurship Impacts Firm growth



Human capital acquisition plays an important role both in the human resource management and venture capital industry. Investors have traditionally attached a high importance to the experiences of entrepreneurs in their evaluation of firm potential (Stuart and Abetti, 1990). This trend is similar in the hiring processes of companies, in which great importance is placed on the educational and work experience backgrounds of employment candidates. In fact, management skills and experience are the most frequently used selection criteria of venture capitalists (Zacharakis and Meyer, 2000). Moreover, researchers have argued that human capital may play an even larger role in the future because of the constant growth of knowledge-intensive activities in most work environments (Yeo and Lee, 2020; Olopade et al., 2020; Kurantin and Osei-Hwedie, 2021).

Acknowledgements

This work was supported by Fundação para a Ciência e a Tecnologia, grant UIDB/00315/2020.

References

- Alvarez, S. A. & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1-2), 11-26.
- Andreu, R. & Sieber, S. (1999). Knowledge and problem solving: A proposal for a model of individual and collective learning. *Working Paper 1/99*. Barcelona.

- Arocena, P. & Villanueva, M. (2003). Access as a motivational device: Implications for human resource management. *Kyklos*, 56(2), 199-221.
- Arshed, N., Rauf, R. & Bukhari, S. (2021). Empirical contribution of human capital in entrepreneurship. *Global Business Review*, 1(2021), 23.
- Balasubramanian, N. (2011). New plant venture performance differences among incumbent, diversifying, and entrepreneurial firms: The impact of industry learning intensity. *Management Science*, 57(3), 549-565.
- Baldwin, L. & Sabry, K. (2003). Learning styles for interactive learning systems. *Innovations in Education and Teaching International*, 40(4), 325-340.
- Baloglu, S. & Uysal, M. (1996). Market segments of push and pull motivations: A canonical correlation approach. *International Journal of Contemporary Hospitality Management*, 8(3), 32-38.
- Baruch, Y. (2004). Transforming careers: from linear to multidirectional career paths: Organizational and individual perspectives. *Career Development International*, 9(1), 58-73.
- Becker, G.S. (1964). Human capital. *Columbia University Press*, New York.
- Bingham, C. B. & Davis, J. P. (2012). Learning sequences: Their existence, effect, and evolution. *Academy of Management Journal*, 55(3), 611-641.
- Block, J. & Sandner, P. (2009). Necessity and opportunity entrepreneurs and their duration in self-employment: Evidence from German micro data. *Journal of Industry, Competition and Trade*, 9(2), 117-137.
- Blundell, R., Dearden, L., Meghir, C. & Sianesi, B. (1999). Human capital investment: The returns from education and training to the individual, the firm and the economy. *Fiscal studies*, 20(1), 1-23.
- Bosma, N. (2013). The global entrepreneurship monitor (GEM) and its impact on entrepreneurship research. *Foundations and Trends in Entrepreneurship*, 9(2), 143-248.
- Brady, T. & Davies, A. (2004). Building project capabilities: From exploratory to exploitative learning. *Organization Studies*, 25(9), 1601-1621.
- Brousseau, K.R., Driver, M.J., Eneroth, K. & Larsson, R. (1996). Career pandemonium: Realignment organizations and individuals. *Academy of Management Executive*, 10(4), 52-66.
- Buzzanell, P. M. & Goldzwig, S. R. (1991). Linear and nonlinear career models: Metaphors, paradigms, and ideologies. *Management Communication Quarterly*, 4(4), 466-505.
- Capello, R. (1999). Spatial transfer of knowledge in high technology milieux: Learning versus collective learning processes. *Regional Studies*, 33(4), 353-365.
- Center for High-Impact Entrepreneurship (2011). 2011 High-impact entrepreneurship global report, Global Entrepreneurship Monitor.

- Cervellati, M. & Sunde, U. (2005). Human capital formation, life expectancy, and the process of development. *American Economic Review*, 95(5), 1653-1672.
- Chaudhuri, S., & Sethi, R. (2008). Statistical discrimination with peer effects: Can integration eliminate negative stereotypes? *The Review of Economic Studies*, 75(2), 579-596.
- Chedli, E. P. & Kchaich, M. (2016). Entrepreneurial motivation and performance of enterprises. *Economics, Management & Financial Markets*, 11(1).
- Cohen-Cole, E. (2006). Housing quality, neurotoxins and human capital acquisition. *Applied Economics Letters*, 13(12), 753-758.
- Coleman, M. & DeLeire, T. (2003). An economic model of locus of control and the human capital investment decision. *Journal of Human Resources*, 38(3), 701-721.
- Cook, D. A., Thompson, W. G., Thomas, K. G. & Thomas, M. R. (2009). Lack of interaction between sensing–intuitive learning styles and problem-first versus information-first instruction: A randomized crossover trial. *Advances in Health Sciences Education*, 14(1), 79-90.
- Corbett, A. C., Neck, H. M. & DeTienne, D. R. (2007). How corporate entrepreneurs learn from fledgling innovation initiatives: Cognition and the development of a termination script. *Entrepreneurship Theory and Practice*, 31(6), 829-852
- Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J. & Ketchen Jr, D. J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology*, 96(3), 443.
- Cruz, C. & Justo, R. (2017). Portfolio entrepreneurship as a mixed gamble: A winning bet for family entrepreneurs in SMEs. *Journal of Small Business Management*, 55(4), 571–593.
- Dabbagh, N. & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and higher education*, 15(1), 3-8.
- Dawson, C. & Henley, A. (2012). “Push” versus “pull” entrepreneurship: An ambiguous distinction? *International Journal of Entrepreneurial Behavior and Research*, 18(6), 697-719.
- De Fraja, G. (2008). Market and public provision in the presence of human capital externalities. *Journal of Public Economics*, 92(5-6), 962-985.
- Dimov, D. (2007). From opportunity insight to opportunity intention: The importance of person-situation learning match. *Entrepreneurship Theory and Practice*, 31(4), 561-583.
- Dimov, D. (2017). Towards a qualitative understanding of human capital in entrepreneurship research. *International Journal of Entrepreneurial Behavior and Research*, 23(2), 210-227.

- Dobryagina, N. (2020). Agricultural entrepreneurship fostering from behavioral decision theory perspective. Celebrity branding impact on financial and non-financial motivation. *The European Journal of Finance*, 1-17.
- Dolton, P. J. & Kidd, M. P. (1998). Job changes, occupational mobility and human capital acquisition: An empirical analysis. *Bulletin of Economic Research*, 50(4), 265-295.
- Edelman, L. F., Brush, C. G., Manolova, T. S. & Greene, P. G. (2010). Start-up motivations and growth intentions of minority nascent entrepreneurs. *Journal Of Small Business Management*, 48(2), 174-196.
- Estrin, S., Mickiewicz, T. & Stephan, U. (2013). Entrepreneurship, social capital, and institutions: Social and commercial entrepreneurship across nations. *Entrepreneurship Theory and Practice*, 37(3), 479-504.
- Farhangmehr, M., Gonçalves, P. & Sarmento, M. (2016). Predicting entrepreneurial motivation among university students: The role of entrepreneurship education. *Education+ Training*, 58(7/8), 861-881.
- Farmer, S. M., Yao, X. & Kung-Mcintyre, K. (2011). The behavioral impact of entrepreneur identity aspiration and prior entrepreneurial experience. *Entrepreneurship Theory and Practice*, 35(2), 245–273
- Felder, R. M, & Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Engineering Education*, 78(7), 674-681.
- Fenwick, T. (2008). Understanding relations of individual—collective learning in work: A review of research. *Management Learning*, 39(3), 227-243.
- Folkestad, G. (2006). Formal and informal learning situations or practices vs formal and informal ways of learning. *British Journal of Music Education*, 23(2), 135-145.
- Friedman, B. A., Aziz, N., Keles, I. & Sayfullin, S. (2012). Predictors of students’ desire to be an entrepreneur: Kyrgyzstan, Georgian, and the United States. *Eurasian Journal of Business and Economics*, 5(9), 129-140.
- Garavan, T. N., Morley, M., Gunnigle, P. & Collins, E. (2001). Human capital accumulation: The role of human resource development. *Journal of European Industrial Training*, 25(2001), 48-68.
- Giacomin, O., Janssen, F., Pruett, M., Shinnar, R. S., Llopis, F. & Toney, B. (2011). Entrepreneurial intentions, motivations and barriers: Differences among American, Asian and European students. *International Entrepreneurship and Management Journal*, 7(2), 219-238.
- Gibbons R. & Waldman M. (1999). Careers in organizations: Theory and evidence. *Handbook of Labor Economics*, 3(1999), 2373-2437.
- Gibbons R. & Waldman M. (2006). Enriching a theory of wage and promotion dynamics inside firms, *Journal of Labor Economics*, 24(1), 59-107.
- Gibbons, R. & Waldman, M. (2004). Task-specific human capital. *American Economic Review*, 94(2), 203-207.

- Jimeno, J., Folta, T., Cooper, A. & Woo, C. (1997). Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly* 42(4), 750–783.
- Győri, Z., Svastics, C. & Csillag, S. (2019). Push and pull motivations of entrepreneurs with disabilities in Hungary. *The 7th International OFEL Conference on Governance, Management and Entrepreneurship: Embracing Diversity in Organisations*. April 5th-6th, 2019, Dubrovnik, Croatia (351-366). Zagreb: Governance Research and Development Centre (CIRU)
- Hayes, J. & Allinson, C. W. (1998). Cognitive style and the theory and practice of individual and collective learning in organizations. *Human Relations*, 51(7), 847-871.
- Hechavarria, D. M. & Ingram, A. (2014). A review of the entrepreneurial ecosystem and the entrepreneurial society in the United States: An exploration with the global entrepreneurship monitor dataset. *Journal of Business and Entrepreneurship*, 26(1), 1-35.
- Jacobs, B. (2007). Real options and human capital investment. *Labour Economics*, 14(6), 913-925.
- Jayawarna D., Jones O., Macpherson A. (2014). Entrepreneurial potential: The role of human and cultural capitals, *International Small Business Journal: Researching Entrepreneurship*, 32(8), 918-943.
- Jayawarna, D., Rouse, J. & Kitching, J., (2011). Entrepreneur motivations and life course. *International Small Business Journal*, 31(1), 34–56.
- Jung, C. G. (1971). Collected works of C. G. Jung, Vol.6: Psychological types (Edited and translated by Adler, G and Hull, R. F. C.), *Princeton University Press, Princeton, N.J.*
- Keith, N. & Frese, M. (2005). Self-regulation in error management training: Emotion control and metacognition as mediators of performance effects. *Journal of Applied Psychology*, 90 (4), 677–691.
- Kim, N. & Atuahene-Gima, K. (2010). Using exploratory and exploitative market learning for new product development. *Journal of Product Innovation Management*, 27(4), 519-536.
- Kinsler, J. & Pavan, R. (2015). The specificity of general human capital: Evidence from college major choice. *Journal of Labor Economics*, 33(4), 933-972
- Kuhn, K. M. & Galloway, T. L. (2015). With a little help from my competitors: Peer networking among artisan entrepreneurs. *Entrepreneurship Theory and Practice*, 39(3), 571–600.
- Kurantini, N. & Osei-Hwedie, B. Z. (2021). Knowledge-based economy: Enhancing economic growth and development of human capital through information and communications technology education. In *Comparative Advantage in the Knowledge Economy*. Emerald Publishing Limited.
- Larsson, R., Driver, M., Holmqvist, M. & Sweet, P. (2001). Career dis-integration and re-integration in mergers and acquisitions: Managing competence and motivational intangibles. *European Management Journal*, 19(6), 609–618.

- Lazear, E. P. (2009). Firm-specific human capital: A skill-weights approach. *Journal of Political Economy*, 117(5), 914-940.
- Lévesque, M., Minniti, M. & Shepherd, D. (2009). Entrepreneurs' decisions on timing of entry: Learning from participation and from the experiences of others. *Entrepreneurship Theory and Practice*, 33(2), 547-570.
- Levie, J. & Autio, E. (2013). Growth and growth intentions: A meta-analysis of existing evidence. *UK: Enterprise Research Centre*, 1(2013), 159-183
- Levie, J. & Hart, M., (2011). Business and social entrepreneurs in the UK: Gender, context and commitment. *International Journal of Gender and Entrepreneurship*, 3(3), 200–217.
- Littenberg-Tobias, J. & Reich, J. (2020). Evaluating access, quality, and equity in online learning: A case study of a MOOC-based blended professional degree program. *The Internet and Higher Education*, 47, 100759.
- Locke, E. (2000). Motivation, cognition, and action: An analysis of studies of task goals and knowledge. *Applied Psychology*, 49(3), 408–429.
- MacMillan, I.C. (1986). To really learn about entrepreneurship, let's study habitual entrepreneurs. *Journal of Business Venturing*, 1(3), 241–243.
- Mahto, R. V. & McDowell, W. C. (2018). Entrepreneurial motivation: A non-entrepreneur's journey to become an entrepreneur. *International Entrepreneurship and Management Journal*, 14(3), 513-526.
- Malebana, M. J. (2014). Entrepreneurial intentions and entrepreneurial motivation of South African rural university students. *Journal of Economics and Behavioral Studies*, 6(9), 709-726.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71-87.
- Martin, B. C., McNally, J. J. & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211-224.
- Marvel, M. R. (2013). Human capital and search-based discovery: A study of high-tech entrepreneurship. *Entrepreneurship Theory and Practice*, 37(2), 403-419.
- Marvel, M., Davis, J.L. & Sproul, C.R., (2016). Human capital and entrepreneurship research: A critical review and future directions. *Entrepreneurship Theory and Practice*, 40(3), 599-626.
- McGrath, R. G. (1999). Falling forward: Real options reasoning and entrepreneurial failure. *Academy of Management Review*, 24(1), 13–30.
- McGrath, R. G. (2001). Exploratory learning, innovative capacity, and managerial oversight. *Academy of Management Journal*, 44(1), 118-131.

- Minniti, M. & Bygrave, W. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory and Practice*, 25(3), 5–16.
- Molander, B. (1993). Kunskap i handling [Knowledge in action]. Göteborg, Sweden: Bokförlaget Daidalos AB.
- Moog, P. (2002). Human capital and its influence on entrepreneurial success. *Historical Social Research/Historische Sozialforschung*, 27(4), 157-180.
- Morales-Gualdrón, S. T., Gutiérrez-Gracia, A. & Dobón, S. R. (2009). The entrepreneurial motivation in academia: A multidimensional construct. *International Entrepreneurship and Management Journal*, 5(3), 301-317.
- Morgan, J. & Sisak, D. (2016). Aspiring to succeed: A model of entrepreneurship and fear of failure. *Journal of Business Venturing*, 31(1), 1–21.
- Murnieks, C. Y., Klotz, A. C. & Shepherd, D. A. (2020) Entrepreneurial motivation: A review of the literature and an agenda for future research. *Journal of Organizational Behavior*. 41(2), 115-143.
- Nahapiet, J. & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2): 242–266.
- Neal, D. (1995). Industry-specific human capital: Evidence from displaced workers. *Journal of labor Economics*, 13(4), 653-677.
- Oketch, M. O. (2006). Determinants of human capital formation and economic growth of African countries. *Economics of Education Review*, 25(5), 554-564
- Olopade, B. C., Okodua, H., Oladosun, M., Matthew, O., Urhie, E., Osabohien, R. & Johnson, O. H. (2020). Economic growth, energy consumption and human capital formation: Implication for knowledge-based economy. *International Journal of Energy Economics and Policy*, 10(1), 37.
- O'mahony, M. A. R. Y. (2012). Human capital formation and continuous training: Evidence for EU countries. *Review of Income and Wealth*, 58(3), 531-549.
- Ost, B. (2014). How do teachers improve? The relative importance of specific and general human capital. *American Economic Journal: Applied Economics*, 6(2), 127-51
- Paulsen, M. B. (2001). The economics of human capital and investment in higher education. *The finance of higher education: Theory, research, policy, and practice*, 55-94.
- Politis, D. (2005). The process of entrepreneurial learning: A conceptual framework. *Entrepreneurship Theory and Practice*, 29(4), 399-424.
- Politis, D. and Gabrielsson, J. (2009). Entrepreneurs' attitudes towards failure: An experiential learning approach. *International Journal of Entrepreneurial Behaviour and Research*, 15(4), 364-383.

- Powell, E. E. & Baker, T. (2014). It's what you make of it: Founder identity and enacting strategic responses to adversity. *Academy of Management Journal*, 57(5), 1406–1433.
- Quiñones, M.A., Ford, J.K. & Teachout, M.S. (1995). The relationship between work experience and job performance: A conceptual and meta-analytic review. *Personnel Psychology*, 48(4), 887–910.
- Rae, D. & Carswell, M. (2001). Towards a conceptual understanding of entrepreneurial learning. *Journal of Small Business and Enterprise Development*, 8(2), 150–158.
- Rae, D. (2000). Understanding entrepreneurial learning: A question of how? *International Journal of Entrepreneurial Behaviour and Research*, 6(3), 145-159.
- Renko, M. (2013). Early challenges of nascent social entrepreneurs. *Entrepreneurship Theory and Practice*, 37(5), 1045–1069.
- Renko, M., Kroeck, K. G. & Bullough, A. (2012). Expectancy theory and nascent entrepreneurship. *Small Business Economics*, 39(3), 667-684.
- Reuber, R.A. & Fischer, E.M. (1994). Entrepreneurs' experience, expertise, and the performance of technology-based firms. *IEEE Transactions of Engineering Management*, 41(4), 365–374.
- Reynolds, P.D. & Curtin, R.T., (2008). Business creation in the United States: Panel study of entrepreneurial dynamics II initial assessment. *Foundations and Trends in Entrepreneurship*, 4(3), 155–307.
- Robichaud, Y., McGraw, E. & Alain, R. (2001). Toward the development of a measuring instrument for entrepreneurial motivation. *Journal of Developmental Entrepreneurship*, 6(2), 189.
- Ronstadt, R. (1988). The corridor principle. *Journal of Business Venturing*, 3(1), 31–40.
- Roper, A. R. (2007). How students develop online learning skills. *Educause Quarterly*, 30(1), 62.
- Rosa, P. (1998). Entrepreneurial process of business cluster formation and growth by “habitual entrepreneurs”. *Entrepreneurship Theory and Practice*, 22(4), 43–61.
- Salas-Velasco, M. (2007). Graduates on the labor market: Formal and informal post-school training investments. *Higher Education*, 54(2), 227-246
- Sarasvathy, S.D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), 243–263.
- Sardana, D. & Scott-Kemmis, D. (2010). Who learns what? A study based on entrepreneurs from biotechnology new ventures. *Journal of Small Business Management*, 48(3), 441-468.
- Schultz, T. W. (1961). Investment in human capital. *The American Economic Review*, 51(1), 1-17.
- Shane, S. & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226.

- Shane, S., Locke, E. A. & Collins, C. J. (2003). Entrepreneurial motivation. *Human Resource Management Review*, 13(2), 257-279
- Sirén, C. A., Kohtamäki, M. & Kuckertz, A. (2012). Exploration and exploitation strategies, profit performance, and the mediating role of strategic learning: Escaping the exploitation trap. *Strategic Entrepreneurship Journal*, 6(1), 18-41.
- Sonnentag, S., (1998). Expertise in professional software design: a process study. *Journal of Applied Psychology* 83, 703–715.
- Stephan, U., Hart, M. & Drews, C.C. (2015). Understanding Motivations for Entrepreneurship - A Review of Recent Research Evidence, Rapid Evidence Assessment paper, UK: *Enterprise Research Centre*.
- Stuart, R. W. & Abetti, P. A. (1990). Impact of entrepreneurial and management experience on early performance. *Journal of Business Venturing*, 5(3), 151-162.
- Sullivan, P. (2010). Empirical evidence on occupation and industry specific human capital. *Labour Economics*, 17(3), 567-580.
- Swanson, C. E. & Kopecky, K. J. (1999). Lifespan and output. *Economic Inquiry*, 37(2), 213-225.
- Turnbull, D. R. & Uysal, M. (1995). An exploratory study of German visitors to the Caribbean: Push and pull motivations. *Journal of Travel and Tourism Marketing*, 4(2), 85-92.
- Unger, J. M., Rauch, A., Frese, M. & Rosenbusch, N. (2011). Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing*, 26(3), 341-358.
- Varis, M. & Littunen, H. (2010). Types of innovation, sources of information and performance in entrepreneurial SMEs. *European Journal of Innovation Management*, 13(2), 128-154.
- Vaz, R. (2021). Firm Growth: A review of the empirical literature. *Revista Galega de Economía*, 30(2), 1-20.
- Vijaya, V. & Kamalanabhan, T. J. (1998). A scale to assess entrepreneurial motivation. *The Journal of Entrepreneurship*, 7(2), 183-198.
- Wang T. & Zatzick C.D. (2019). Human capital acquisition and organizational innovation: A temporal perspective. *Academy of Management Journal*, 62(1), 99-116.
- Wang, C. L. & Chugh, H. (2014), Entrepreneurial learning: Past research and future challenges. *The International Journal of Management Reviews*, 16(1), 24-61.
- Wang, C. L. & Rafiq, M. (2009). Organizational diversity and shared vision: Resolving the paradox of exploratory and exploitative learning. *European Journal of Innovation Management*, 12(1), 86-101.
- Weber, K., Heinze, K. L. & DeSoucey, M. (2008). Forage for thought: Mobilizing codes in the movement for grass-fed meat and dairy products. *Administrative Science Quarterly*, 53(3), 529–567.

- West, C. R., Kahn, J. H. & Nauta, M. M. (2007). Learning styles as predictors of self-efficacy and interest in research: Implications for graduate research training. *Training and Education in Professional Psychology*, 1(3), 174.
- Westhead, P. & Wright, M. (1998). Novice, portfolio, and serial founders: Are they different? *Journal of Business Venturing*, 13(3), 173–204.
- Wiswall, M. & Zafar, B. (2021). Human capital investments and expectations about career and family. *Journal of Political Economy*, 129(5), 1361-1424.
- World Bank, (2020). The human capital index 2020 update: Human capital in the time of COVID-19. *The World Bank*.
- Yeo, Y. & Lee, J. D. (2020). Revitalizing the race between technology and education: Investigating the growth strategy for the knowledge-based economy based on a CGE analysis. *Technology in Society*, 62(2020), 101295.
- Zábojník J. & Bernhardt D. (2001). Corporate tournaments, human capital acquisition, and the firm size-Wage relation. *Review of Economic Studies*, 68(3), 693-716.
- Zacharakis, A. L. & Meyer, G. D. (2000). The potential of actuarial decision models: can they improve the venture capital investment decision? *Journal of Business Venturing*, 15(4), 323-346.
- Zhao, Y., Li, Y., Lee, S. H. & Chen, L. B. (2011). Entrepreneurial orientation, organizational learning, and performance: Evidence from China. *Entrepreneurship Theory and Practice*, 35(2), 293-317.