Studies on Entrepreneurship, Structural Change and Industrial Dynamics

Giulio Bosio · Tommaso Minola
Federica Origo · Stefano Tomelleri
Editors

Rethinking Entrepreneurial Human Capital

The Role of Innovation and Collaboration

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Introduction

Giulio Bosio, Tommaso Minola, Federica Origo, and Stefano Tomelleri

Abstract The last decades have witnessed a number of structural changes (such as increasing demand for skill, population ageing and new waves of technological progress) that are posing new challenges to firms, also in terms of entrepreneurial human capital. In this context, entrepreneurship education plays a crucial role for the development of entrepreneurial skills, including the value of collaboration in the business activities. This book focuses the attention on entrepreneurial human capital by investigating to what extent it can be stimulated by entrepreneurship education through activities that combine collaborative practices and innovation. This introductory chapter provides a background for the book, a brief overview of its main contents, pointing out, for each chapter, the main research questions, methodology and results. Finally, it proposes some avenues for future research on the relationship between entrepreneurial human capital, innovation and collaborative practices.

Keywords Entrepreneurial human capital · Collaboration · Innovation · Structural change · Multidisciplinarity

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In the last decades, a number of structural changes have been posing new challenges to organizations. On the one hand, socio-demographic changes such as increasing female educational attainment and labor market participation, population ageing and migration flows have increased the diversity of potential workforce, requiring more articulated and flexible Human Resources policies (Shen et al. 2009). On the other hand, recent waves of technological progress, particularly in Information and Communication Technology (ICT), have deeply changed the nature of (several) jobs, causing massive flows of job creation and destruction (Autor 2015).

The most recent wave of technological progress, labeled Industry 4.0, differs from the previous "industrial revolutions" for the increasing interconnection between the real and the virtual world, especially in manufacturing. New ICT applications now allow to collect and process a large amount of information (the so called *Big Data*) for production and service deployment purposes, to integrate systems at all the production stages, to link machines and workers both within and outside the firm (involving suppliers, distributors and sometimes also final clients). Intelligent robots and tools exploit the potentially continuous flow of data to re-configure themselves in order to respond in real time to any change in the production cycle and/or in customers demand, thereby enabling an increasing customer segmentation and product personalization.

This new wave of technological progress is likely to impact both employment levels and composition within the firm and, ultimately, the skills required in the production process, including what has been referred to as *entrepreneurial human capital*: a complex and multidimensional asset, made of specialized, high-level entrepreneurship-specific skills and knowledge related to different business-related aspects, such as sales, negotiations, product development, and risk judgment (Shane 2003).

There is a substantial consensus among scholars and policy makers about the effects of entrepreneurship as a key driver of innovation and economic growth. Furthermore, recent theoretical and empirical evidence shows that entrepreneurial human capital is a distinct channel through which firm-specific human capital drives endogenous growth (Ehrlich et al. 2017). However, we know relatively little about the various and nuanced dimensions and antecedents of entrepreneurial human capital. So far there has been little attempt to evaluate in what ways the latent entrepreneurial capacity and knowledge can be developed or adapted to the changing working or business conditions. In this context, the main question is whether and how entrepreneurial skills can be effectively taught and learned. A complementary question is how to measure the stock of this specific kind of human capital and identify the set of skills that must be fostered. Finally, it is crucial to better understand the causal link between entrepreneurial human capital and firm's performance, especially in terms of innovation capacity and competition in international markets. To properly answer these questions, it is necessary to focus on the role and characteristics of entrepreneurship education as the privileged tool to promote entrepreneurial intentions and skills. Entrepreneurship education, in fact, should help students to develop the entrepreneurial knowledge that facilitates them to identify and act upon entrepreneurial opportunities (Hahn et al. 2017). The potential returns of entrepreneurship education are then not limited to the start-up of new companies or to the creation of new jobs. In a more comprehensive vision, entrepreneurship education should provide key competences to all students, regardless of their future employment status, to turn ideas into action, also by increasing creativity and self-confidence (European Commission 2008).

Furthermore, the greater pressure faced by firms to be flexible, innovative and adaptable in increasingly dynamic business environments has led to new forms of organizations and work, generating the urgency for collaboration both within and between firms, often requiring to cross geographical and technological boundaries (Hagerdoorn 2002). This process has involved private firms, organizations as well as public institutions.

Today competitive markets call for knowledge and information sharing as a key mechanism in driving both individual and organizational success and development. Taking a deeper look, the new technological revolution requires not only the need to create new connections and links between different social agents and firms, but also different perspectives in which economic and social development comes from collaboration practices.

The latest wave of technological progress has highlighted that innovation and collaboration are intrinsically related and their nexus may be exploited as a potential source of competitive advantage (Dyer and Singh 1998). Indeed, collaborative practices and partnerships raise the development of organizations, enhancing access to resources and funding as well as providing, at the same time, a mean for long-term sustainability. It also stimulates the exchange of tacit knowledge among people. In this way, how, why and when collaboration occurs within and among organizations represents an emergent and still largely unexplored area of research that has the potential to greatly advance knowledge on the application of these new practices in a wide range of areas.

The growing dynamics of collaborative practices are raising increased attention on the relevance of the concept of "soft skills", such as cooperation, team-working, ability to negotiate, openness and social skills, which represent key determinant of individual behavior and success both at school and in business activities (Heckman and Kautz 2012). The question is therefore whether soft skills can be stimulated by, and personal enhancement can be pursued with, specific education programs. In this direction, the diffusion of collaborative practices and the focus on soft skills in entrepreneurship education have concerned all educational levels, even in university degrees.

Conceptually, entrepreneurship education can be interpreted as a specific tool for promoting the development of an entrepreneurial mindset and more specifically, the value of collaboration in the business activities (European Commission 2008). Indeed, understanding and embracing the role of collaborative practices is so relevant that nearly all entrepreneurship courses include team-based project work (Lackeus 2015). This method emphasizes the rewards of collaboration in obtaining a common goal and reflects a "gold" standard in teaching entrepreneurial mindset. A denser and more collaborative entrepreneurial network can generate positive spill-overs on the process of entrepreneurial human capital accumulation and hence, given the dynamic nature of entrepreneurial learning, represents a key element to boost entrepreneurship as a career option.

In light of these considerations, this book focuses the attention on the specific traits and the nature of entrepreneurial human capital, in particular by investigating to what extent it can be stimulated by entrepreneurship education through activities that combine collaborative practices and innovation. The book includes a

comprehensive and multidisciplinary collection of contributes—providing both theoretical reflections as well as empirical evidence—on how entrepreneurship education can be structured. It also contributes to the ongoing debate on whether and how entrepreneurial skills can be actually taught, pointing to the role of innovation and collaboration in the design of educational programs that have the purpose to spread entrepreneurial human capital.

The book is structured into two main parts. The first part sets the contextual background, highlighting the main features of recent structural changes in ICT and robotics that have deeply influenced the production process, focusing on their effects on work practices within the firm and, specifically, on entrepreneurial human capital. Furthermore, it presents some evidence on the relationship between the latter and some specific organizational outcomes. Finally, it points to the role of entrepreneurship education to foster both collaboration and creativity, looking at the definition and relationships of these concepts in the EU education policies.

The second part provides examples of how collaborative practices can be valuable to entrepreneurship research and practice. These practices represent inputs to the design and organization of entrepreneurship education across campuses, as well as illustrative cases for teaching purpose in innovation and entrepreneurship classes.

This book results from an articulated selection process and includes some of the contributions, especially those dealing with collaborative practices in entrepreneurship education, presented at the scientific workshop "Together. Collaborative practices in groups and organizations" held at the University of Bergamo on 18th and 19th of May 2016. Other chapters have been invited after a careful evaluation of their contribution to the discussion on the role of collaborative practices and innovation within the framework of entrepreneurship education. Each contribution has undergone a blind review process, involving internal and external referees.

1 Structural Changes and Entrepreneurial Human Capital

In the last decades, continuous advances in ICT technologies, computerization and robotics have caused significant changes within the workplace, enabling new forms of businesses and contributing to economic growth. As pointed out in the chapter by **Bosio and Cristini**, this new wave of technological progress caused significant changes on employment levels and composition within the firm and, ultimately, on the skills required in the production process. Most of the earliest literature has focused on either changes in employment or jobs, finding rather mixed results. Some studies point out that the new technologies have been progressively substituting for labor in the production process, causing a significant job destruction across a wide range of occupations (substitution theory; see Akst 2013 or Brynjolfsson and McAfee 2014). Other studies agree that automation substitutes for labor, but it can also complement it, also through positive indirect effects on productivity and earnings (compensation theory; see Autor 2015 or Acemoglu and Restrepo 2016). A recent strand of literature, also thanks to new datasets that allow to precisely

measure tasks within occupations, argue that the fraction of jobs that is likely to disappear in the next years due to the new technologies is rather low in OECD countries. However, at least one quarter of the existing jobs, especially among the low skilled ones, will experience a major change in their task contents (OECD 2017). In this respect, occupations are the best units of analysis and a "task approach" is the most suitable methodology to fully account for the effect of ICT and automation in the labor market. Using this approach, recent studies point to job polarization as a recurring empirical fact in most OECD countries: a relative decline in the demand for middle occupations, characterized by routine tasks that could be easily performed by the new machines, has been associated to a significant increase in labor demand for both high and low skilled occupations characterized by non-routine tasks (see Autor and Dorn 2013 for the USA; Goos et al. 2009 on Europe). Bosio and Cristini provide further evidence on job polarization in Europe, exploring differences across groups of countries. Their shift-share analysis shows that job polarization is a common phenomenon across Europe, with the occupational distribution shifting from routine to both abstract and manual jobs, even if the growth of manual occupations is still limited, especially in Continental and Mediterranean EU countries, compared to the USA. Furthermore, in Nordic countries the decline in routine occupations has been less pronounced than in other EU areas, while the UK has registered the greatest reallocation of employment shares towards non-routine occupations, equally distributed among abstract and manual ones. While acknowledging the role of automation in explaining these trends, Bosio and Cristini point to the role of differences in the institutional setting across countries, especially in labor and product market regulation, which can in turn influence entrepreneurial activity and dynamism, as additional factors that can explain heterogeneous trends in job polarization across countries.

The complementarity between new technologies and high skilled occupations suggests the existence of organizational complementarities, meaning that the adoption of ICT is more effective in organizations with more skilled people and which simultaneously implemented a significant organizational change, characterized by decentralized workplace organization (Bresnahan et al. 2002). Such type of work organization requires a higher worker engagement along many dimensions, including work autonomy, task discretion, involvement in decision making at the workplace or firm level and financial participation. **Bryson** provides a multidisciplinary overview on the history of employee engagement, investigating how the so-called "high-involvement", "high commitment" or "high performance" workplace practices (Lawler 1986; Appelbaum et al. 2000) can produce mutual gains in the modern workplace. These benefits take the form of higher labor productivity and profitability for the employers, while for employees they arise through higher job satisfaction due to engaging in enjoyable work, controlling their own working environment and feeling part of the enterprise. Notice that these practices may be the antecedents of intrapreneurship, since a more engaged worker is more likely to take some risk and undertake initiatives, often requiring creativity and innovation, which may end up in the creation of a profitable venture within the organization (Jong and Wennekers 2008). Empirical evidence, mainly on Britain, shows that human resource

management (HRM) practices promoting workers autonomy are not as widespread as economics and management theory predicted at the wake of the ICT revolution. Furthermore, while workers believe that having a paid job is important for their wellbeing, they declare negative feelings while at work, confirming the traditional economic assumption of disutility from work and casting doubts on whether and how workers are actually "engaged" in their jobs. Bryson provides also new evidence on the existence of mutual gains using the 2004 and 2011 waves of the Workplace Employment Relations Surveys. From the workers' side, he finds a U-shaped relationship between HRM intensity and various indicators of employee job attitudes, suggesting that adding further HRM practices can elicit employee engagement only at relatively high levels of HRM intensity. In this sense, there seems to be an optimal number of "high-involvement" HRM practices making the employees actually engaged in their work. These results also suggest that entrepreneurial human capital may play a role in promoting a mix of HRM practices that can actually make the employees engaged in the firm. From the employer's side, Bryson's estimates show that employee engagement (measured by an index capturing employee perceptions of how good managers are at seeking their views, responding to them and allowing them to influence decision-making) is the only employee attitude that is significantly associated, other things equal, with higher workplace performance, especially in terms of labor productivity. From a policy point of view, these results call for more governmental interventions in promoting greater employee engagement at the workplace, also in light of the underinvestment that firms are likely to do on it if they do not consider the social benefits of these practices.

A closer look to the role of entrepreneurial human capital in influencing economic growth is taken in the chapter by **Capelleras, Martin-Sanchez, Rialp and Shela**. They investigate the effect of entrepreneurs' exports orientation on growth aspiration taking into account entrepreneurs' level of human capital. Their analysis departs from the idea that entrepreneurs starting their export activities have to face organizational and environmental obstacles, also due to the lack of regional specific knowledge, that are not experienced by their host counterparts (Zaheer 1995; Johanson and Vahlne 2009). Consequently, entrepreneurs' may try to enter the unknown foreign market also going beyond prevailing norms and using their own judgmental sense to seize available opportunities (Wiltbank et al. 2006). Therefore, one would expect that the entrepreneurs' export orientation will have a positive impact on their aspirations to grow the new business. However, such relationship may depend on entrepreneurial human capital, since high skilled entrepreneurs (where skills can be proxied by either the level of education or work experience) will be more able to better identify profitable business opportunities in the host country compared to low skilled ones; this ultimately will motivate them to achieve higher growth aspirations. The original empirical analysis carried out by the authors is based on individual data from the Global Entrepreneurship Monitor (GEM) combined with country-level data from the World Development Indicators (WDI) dataset by the World Bank in 78 countries from 2003 to 2001. Estimates obtained with multi-level models show that on average entrepreneurs' export orientation does

not significantly affect growth aspirations. However, effect on aspirations is significantly higher for those entrepreneurs with higher levels of education and entrepreneurial experience. A straightforward policy implication of these results is that promoting higher education attainment would help the entrepreneurs to improve their cognitive abilities and awareness to create new opportunities.

If entrepreneurial human capital is an input factor of economic growth and education plays a role in creating it, entrepreneurship education should stand out as the preferred tool to teach and improve this specific form of human capital. The chapter by **Magni and Mazzini** introduces to the central topic of our analysis with a multidisciplinary overview, which spans from the idea of collaboration, entrepreneurship and management skills in the work of the ancient Greek thinkers Aristotle and Xenophon to the current European documents on entrepreneurship education. In a collaborative organization, resources are shared and mutual cooperation among its members creates a common identity. Hence, teamwork and networking are both strategic skills and work practices that should be promoted to grant organization's success. In this perspective, Aristotle's concept of *philìa* should be associated with a positive idea of entrepreneurship and the latter should build on the concepts of work ethics highlighted by Xenophon in his Socratic dialogue *Oeconomicus*. In light of these lessons from the ancient past, Magni and Mazzini review the most relevant European Union's policy documents on entrepreneurship education (European Commission 2003, 2006 and 2013) to verify to what extent the "classical" perspective still permeates the current definition of entrepreneurship and skills. Their analysis shows that the EU documents point to the need to foster individual entrepreneurial spirit both investing in entrepreneurship education and promoting at least one practical business experience within compulsory education. The development of the "sense of initiative", teamwork ability and creativity are in the same line with those proposed by Xenophon, but the European definition of skills is quite different. While in Xenophon's perspective skills are not something to be learned, but are an essential part of each person, in the European perspective skills are standardized competences, which can be classified in levels and to which all individuals should adapt, first during schools and subsequently at the workplace. Magni and Mazzini conclude that, in order to re-build a pedagogical perspective centered on each person rather than on "something" that should be learned, it is important to recover those prerequisites identified by Xenophon, which involve also human values that may be important for both organizational and social wellbeing.

2 Collaboration and Innovation in Entrepreneurship Education Practices

Several researchers have observed a growth of entrepreneurship education diffusion (Morris et al. 2013), which has occurred in a multitude of ways. Sustaining such growth is challenging, especially when universities need to increase

entrepreneurship education by reaching out different disciplines and divisions on a university campus. Due to the variability in program design and implementation, identifying what factors determine the long-term success or failure of entrepreneurship programs is not trivial. By drawing on service science theory, **Hoy and Pavlov** examine how entrepreneurship education programs may be designed, implemented and assessed. Such approach allows analyzing education practices by incorporating the common elements of service systems. The experience at Worcester Polytechnic Institute in the United States is offered as a case study. The chapter offers a methodological contribution to the entrepreneurship literature, but also a practical contribution since the framework proposed can support strategic planning by university leaders and program directors. According to the "entrepreneurial university" vision (Fayolle and Redford 2014; Minola et al. 2016), universities must become entrepreneurial in *all* their activities in order to survive in the competitive educational marketplace. As an aid for strategy, the authors organize all framework elements into a Service Science Canvas. Its constitutive elements are the following: Resources, Access rights, Entities, Stakeholders, Value Co-Creation, Networks, Ecology, Governance, Outcomes, and Measures. By in-depth analyzing the case of Worcester Polytechnic Institute, the author introduce Service Science Canvas as a means for analyzing *education as a service* with a comprehensive entrepreneurship education as an example.

In different realms of society, established practices are altered and new ones are created thanks to digitalization, with its technologies, processes and application George et al. (2016). Academic research in management makes no exception in this regard (Obschonka 2017; Obschonka et al. 2017). **Fini et al.** focus on how ICT technologies and data science protocols can benefit management research, and particularly the field of entrepreneurship. After outlining commonalities and trends in management and data science research, they present some practical examples arising from several collaborative projects; these span from university–industry collaborations and technology and innovation management, to scientometrics, and from strategy processes in the tourism sector to business performance analytics. Implications for using data science in entrepreneurship and management research are finally offered by the authors. Beyond such contributions, the chapter offers a valid set of example that can be used in classes, especially those that are problem or case-based.

The relationship between research and practice, and between researchers and practitioners in particular (Hodgkinson et al. 2001; Alferoff and Knights 2009), is key to make organizational research more and more responsive to all its potential stakeholders. In line with the tradition of action research (e.g. Cassell and Johnson 2006) and collaborative processes (Shani et al. 2008; James and Denyer 2009), collaboration is crucial in research (Shani and Coghlan 2014).

In this context, the contribution of **Cirella** aims to understand whether and how a collaborative research project offers long-term organizational impacts. A collaborative management research (CMR) process is utilized as case. It consists in a collective effort performed at the Polytechnic University of Milan (Italy) by three researchers in organizational behavior and human resources management, together with an Italian fashion company. Based on the follow-up illustration, derived by data