



MOOCs
for the world
of business

BizMOOC Discussion paper 13

Entrepreneurship Education, MOOCs and
beyond

R1.1/13

BizMOOC Discussion paper 13

Entrepreneurship Education, MOOCs and beyond (Identification of existing online learning materials with regards to entrepreneurship)

Result 1.1

BizMOOC - BizMOOC - Knowledge Alliance to enable a European-wide exploitation of the potential of MOOCs for the world of business

Programme: Erasmus+ | Key Action 2 | Knowledge Alliances

Reference Number: 562286-EPP-1-2015-1-AT-EPPKA2-KA

Grant agreement number: 2015-2929 / 001-001

Project Duration: 36 months, 1/1/2016 – 31/12/2018

Version 1.0 published in 2016; updated version as of September 2018

Table of Contents

1.	Summary.....	3
2.	Entrepreneurship.....	3
3.	Entrepreneurship Education.....	5
4.	Online Entrepreneurship Education.....	9
5.	International and European MOOCs on entrepreneurship.....	10
6.	Recent MOOC Trends and the Rise of Micro-credentials.....	16
7.	Conclusions.....	19
	Annex 1: Entrepreneurship Micro-credentials of 5 MOOC platforms.....	21
	References.....	22

Entrepreneurship Education, MOOCs and beyond

Authors: Christian Friedl (FH JOANNEUM), Christoph Resei (FH JOANNEUM), Agnes Zur (Cracow University of Economics), Andrea Kalafúsová (Košice IT Valley z.p.o.)

1. Summary

The goal of this study was to explore and compare existing online courses, focusing on MOOCs in particular, in the area of entrepreneurship in order to classify the existing offers, different approaches and identify current and future trends. It is based on desk research provided simultaneously by experts of various fields from different EU countries, including literature review and a comparative analysis. The main criteria adapted for the comparative analysis were: focus of the course, format, length, fees and language of the course. Examples which are provided in this paper were chosen based on rate of popularity measured in number of participants and their academic and didactical value

The paper starts with introductory information about entrepreneurship, entrepreneurship education and online entrepreneurship education. Next, it presents an overview of existing online courses devoted to entrepreneurship education around the world, contrasted with European standards in entrepreneurship education and provides suggestions regarding best practices and recommendations to MOOC users interested in expanding their entrepreneurship knowledge and skills. Furthermore, recent MOOC trends, such as the rise of micro-credentials are discussed, including a brief comparison of existing entrepreneurship micro-credentials on five pre-selected MOOC platforms.

Research findings have confirmed that the whole education sector is currently disrupted by digitalization processes and innovation pressure, which also heavily affects entrepreneurship education. There is a clear trend of an increasing offer of corporate entrepreneurship courses and most courses today focus on start-ups and teaching entrepreneurial skills. The education focus has shifted to entrepreneurship FOR entrepreneurs, strongly based on the application of innovative start-up tools, such as Canvas and Lean Approach. Finally, the number of micro-credentials, full online degrees and courses aimed at corporate learning by the popular MOOC platforms is rapidly growing, MOOCs are getting more flexible but content is increasingly locked behind paywalls.

The first version of this article was published in June 2016 and updated/enlarged in September 2018.

2. Entrepreneurship

Entrepreneurship is a wondrous human activity that cuts across all sectors and aspects of human existence. It is a broad and inclusive term, which serves as an umbrella concept for numerous phenomena (Žur, 2014). Whether at individual or company level, academically entrepreneurship is typically associated with opportunity. Opportunity is referred to as the dominant thread in current mainstream entrepreneurship research (Shane, 2000; Venkataram et al., 2012). According to Stevenson & Jarillo (1990), the pursuit of

opportunity defines the ability of the individual, as well as that of the organization, to be entrepreneurial. Contemporary coexisting convictions regarding entrepreneurship are rather completing than competing, all referring to the identification, evaluation and pursuit of opportunity (Stevenson & Jarillo, 1990; Jones & Butler, 1992; Shane & Venkataram, 2000).

At individual level, entrepreneurship is defined as the process of new business creation (Timmons, 1985), commonly referred to as start-ups. However, in the last decades entrepreneurship and new venturing has been recognized and supported in numerous other fields of human activity, including social, academic and cultural behaviour.

Company level entrepreneurship encompasses three terms. Entrepreneurial Orientation represents a company's orientation toward entrepreneurship (Dess & Lumpkin, 2005), its culture, HR practices and other ways. It creates the predisposition of a company to act in entrepreneurial ways. Corporate Entrepreneurship (CE) refers to actual entrepreneurial behaviour exhibited by the company itself (Zahra & Kuratko, 1999). Antoncic & Hisrich (2001, p. 23) specify that CE is a "process of creation of new businesses, and other innovative activities, such as development of new products, services, technologies, administrative techniques, strategies and competitive postures." The third term intrapreneurship relates to entrepreneurial behaviour of employees (Pinchot, 1985; Kanter, 1985).

Entrepreneurship in its broad and more popular sense is also conceptualized and perceived as a universal set of skills and attitudes that can be applied in undertakings in every context – new business, company project, social venture or international cultural exhibition (Di-Masi, 2010). Entrepreneurship skills and attitudes are essential at all stages of a professional career and add substantial value to all human activity.

All existing conceptualizations of entrepreneurship are rather completing than competing, all relying on three leading measures: innovation, risk-taking and pro-activeness (Miller, 1983).

In the new century, entrepreneurship has been moving away from traditional management practices towards a more practical, hands-on orientation, better fitting to the extreme uncertain environments in which entrepreneurs operate in. This is reflected in a paradigm shift from comprehensive upfront business planning and traditional accounting methods (though well-approved in established businesses, but not well applicable to start-ups) to more agile and lean business modelling, validation and innovation accounting practices. Most famous representatives are the Business Model Canvas introduced by Osterwalder et al. (2010), the Lean Start-Up approaches by Ries (2011) and Blank (2010, incl. his customer development approach, 2005), the conquest of the Design Thinking methodology in the business domain in the 21st century or new innovation accounting practices such as Moneyball for Start-Ups by McClure (2010). Since then, we observe a new wave of tools and methods especially designed for entrepreneurs and multiple

additional canvases and tools have been developed on top of those game-changing approaches. Examples are Ash Maruya's Lean Canvas (2012 [2010]) or Osterwalder et al.'s Value Proposition Canvas (2015), to name but a few.

Interestingly, with the renaissance of corporate entrepreneurship in the era of digitalization and disruptive innovation (in line with Christensen's Innovator's Dilemma, 1997), we see those contemporary entrepreneurship approaches increasingly being converted back to traditional management of established businesses of all sizes, which are trying to stay innovative and alive by adapting modern start-up approaches for their own management. Ries for example adapted his Lean Start-Up Approach for companies and Viki, Toma and Gons (2017) recently introduced an Innovation Ecosystem to support corporates innovating like start-ups without becoming like start-ups.

3. Entrepreneurship Education

The entrepreneurial mystique? It's not magic, it's not mysterious, and it has nothing to do with the genes. It's a discipline. And, like any discipline, it can be learned. (Drucker, 1985)

Entrepreneurship has received immense academic (and non-academic) attention in the last decades (Stevenson & Lundström, 2001). It is an important area of inquiry, especially relevant in times of crisis and economic challenges. Furthermore, the European Union has launched numerous programs aimed at creating and reinforcing the entrepreneurial culture and entrepreneurship education is a fundamental element of its policy. European conceptual frameworks for entrepreneurship education encourage building an "entrepreneurial spirit, development of creativity, initiative and self-confidence¹." The European Union defines as one of the eight key competences for Lifelong Learning "Sense of initiative and entrepreneurship":

It is the ability to turn ideas into action. It involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. The individual is aware of the context of his/her work and is able to seize opportunities that arise. It is the foundation for acquiring more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance (European Parliament and Council, 2006).

Therefore, much effort is put into promoting entrepreneurial behaviour across countries. The European

¹ Analytical Report "Entrepreneurship in the EU and Beyond", European Commission, Flash Eurobarometer, (2010) No. 283.

Commission has stated in their Entrepreneurship 2020 Action Plan that investing in entrepreneurship education is one of the highest return investments Europe can make (EC, 2013). Overall, entrepreneurship education has gained importance and been implemented in the national strategies of most EU member states, given the premise that it may influence the level of entrepreneurial activity in a given country, positively impacts entrepreneurial intentions or positively influences entrepreneurial traits, supports economic growth and creates jobs (Dickson et al. 2008; EC, 2013; Kuratko, 2005). Several authors have highlighted the critical role of entrepreneurship education in developing more and/or better entrepreneurs (e.g. Gorman, Hanlon, & King, 1997; Katz, 2014; Pittaway & Cope, 2007). Elert, Andersson and Wennberg (2015) have shown that entrepreneurship education increases self-confidence, long-term probability of starting a firm, as well as entrepreneurial incomes. Von Graevenitz, Harhoff and Weber (2010) confirmed the positive effects of entrepreneurship education on student's self-assessed entrepreneurial skills and the learning process of their entrepreneurial suitability or aptitude. A survey by Jenner (2012) suggests that 15% to 20% of students who took part in a mini-company program in secondary school will later establish their own business, a percentage which is about three to five times higher than within the general population. Finally, Martin, McNally and Kay (2013) found a significant relation between entrepreneurship education/training (EET) and entrepreneurship-related human capital assets and entrepreneurship outcomes.

In the last twenty years, we have witnessed an immense and dynamic growth of entrepreneurship teaching programs all over the world. Entrepreneurship education has become a standard practice at secondary and higher education institutions in countries around the world (Katz, 2003; Kuratko, 2005). This growth in volume and scope has been coupled by a sharp shift from educating *about* entrepreneurship to educating *for* entrepreneurship. Education about entrepreneurship is limited to knowledge transfer. Students learn about starting a business, about legal and business frameworks, what does it mean to be entrepreneurial or how to prepare a business plan. The goal of this type of education is to acquaint students with many aspects of entrepreneurial practice and pursue their understanding of them. However, after many years of this standard approach, we now know that educating about entrepreneurship does not necessarily imply that students become more entrepreneurial nor that they wish to act in entrepreneurial ways (Dickson et al., 2008).

Educating *for* entrepreneurship is driven by a different goal. It is to develop real-life entrepreneurial skills and behaviours. Some authors go as far as to say that the goal is to change thinking and behavioural patterns (Rae 2005). Rae (2010, p. 595) defines entrepreneurial learning as "led by creativity, informality, curiosity, emotion and its application to personal and real-world problems and opportunities". It is a holistic process, engaging numerous areas of human activity, primarily intellectual and emotional. Wilson, Vyakarnam, Volkmann, Mariotti and Rabuzzi (2009) argue that entrepreneurship education should provide a mix of experiential learning, skills building and mindset shift, ideally starting from the primary level up.

Hence, contemporary education for entrepreneurship includes the promotion and training of personal skills related to entrepreneurship, such as creativity skills, problem-solving skills, communication skills and networking skills. Repeatedly, these features have been identified in the recent past as the goals of entrepreneurial education. A meta-analysis conducted by Mwasalwiba (2010) of top entrepreneurship education programs identifies the following distribution of goals among goals of the education process:

- to enhance attitudes, values, intentions and behaviours – 36%,
- to improve personal skills – 32%,
- to develop opportunity recognition skills – 14%,
- to develop skills necessary for establishing a new business – 9% and
- to acquire general management and organizational skills – 9%.

The analysis of other publications reveals a very clear hierarchy of goals within entrepreneurship education, consistent with the above meta-analysis (Raposo & Paco, 2011). Firstly, all existing conceptualizations include the dominating goal of developing an entrepreneurial drive, spirit and culture among students. In second place comes the goal of generating the ability to recognize and pursue opportunities in various areas, whether business, social and academic. A significant number of authors associate entrepreneurship with the ability to create and operate new companies. Mwasalwiba (2010) notes that scholars in the field of entrepreneurship education are converging towards a single framework of entrepreneurship education. Still, Mwasalwiba (2010) also highlights the lack of shared success indicators and common goal definitions between educators and other stakeholders, when it comes to entrepreneurship education for different target groups.

In the context of entrepreneurial competences, the Entrepreneurship Competence Framework (EntreComp) developed by the European Union in 2016 has to be mentioned (Bacigalupo, Kampylis, Punie, & Van den Brande, 2016).

The EntreComp Framework describes entrepreneurship as

A transversal competence, which can be applied by citizens to all spheres of life from nurturing personal development, to actively participating in society, to (re)entering the job market as an employee or as a self-employed person, and to starting up ventures (cultural, social or commercial) (Bacigalupo et al., 2016, p. 6).

This definition is based on a broader definition by FFE-YE (2012) which describes entrepreneurship as acting upon opportunities and ideas and transform them into value (financial, cultural, or social) for others.

According to the EntreComp Report, there is an increasing awareness that entrepreneurial skills, knowledge and attitudes can be learned and in addition, foster the development of entrepreneurial mindsets and culture. In order to create a bridge between the two worlds of education and work and reach consensus among all stakeholders, the framework provides a common definition of entrepreneurship as a competence. The Framework serves as a foundation for the design of curricula and learning activities aimed at developing entrepreneurship competences (e.g. stimulate intrapreneurship within existing organizations). In addition, the framework enables the development of parameters and tools for the assessment of individual entrepreneurial competences.

The EntreComp Framework itself includes 15 entrepreneurship competences within the 3 competence areas “Ideas and opportunities”, “Resources” and “Into Action”. Figure 1 below illustrates the framework and its building blocks of entrepreneurship competences. In addition, the respective competences can be measured on an 8-level progression model and the report also includes a comprehensive list of 442 learning outcomes.

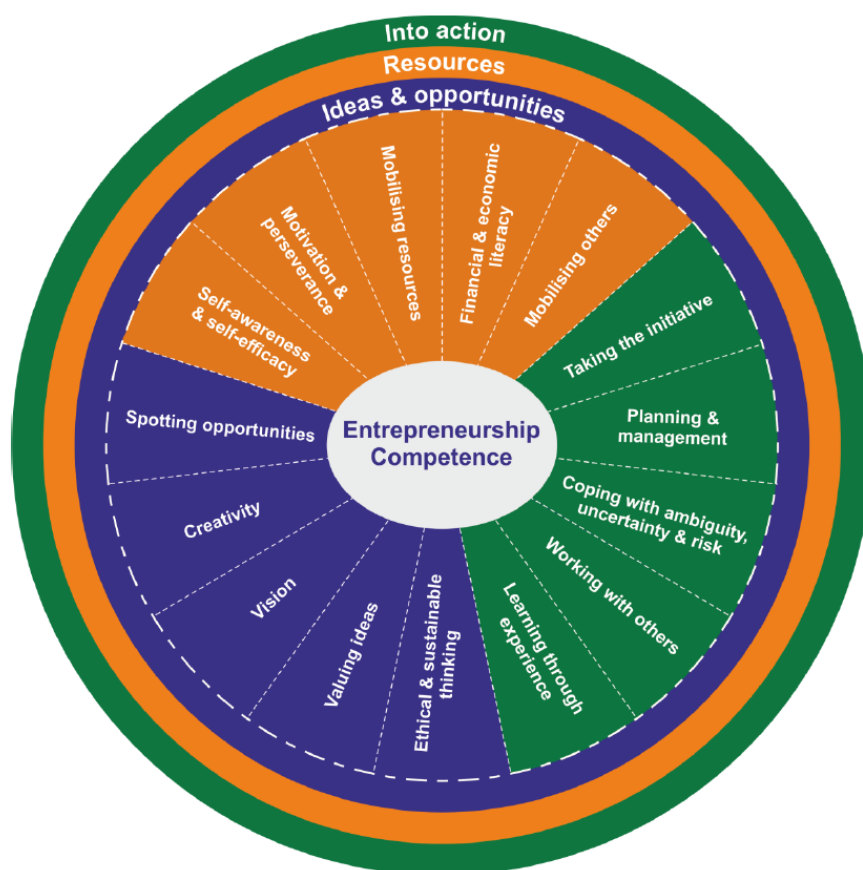


Figure 1: EntreComp Framework (Bacigalupo et al., 2016)

4. Online Entrepreneurship Education

Clearly, for entrepreneurship education to embrace the 21st century, professors must become more competent in the use of academic technology and also expand their pedagogies to include new and innovative approaches to the teaching of entrepreneurship. For example, the use of video conferencing and streaming of video case studies show promise as viable uses of educational technology. (Solomon et al., 2002, pp. 82–83)

The popularization of entrepreneurship education has accelerated in the last two decades in great part thanks to the new opportunities brought by information technologies. Online learning materials have become abundant and diverse. Online courses facilitate the development of entrepreneurial skills by individuals on their own by means of electronic devices. New technology has made it possible to learn from successful entrepreneurs, share experiences and exchange ideas, as already recognised by Solomon back in 2002 in his statement above. Today, thanks to technology, entrepreneurship education is not only easy to access, but it has become more inspirational than ever. Contemporary authors and educators (Pittaway & Cope, 2007; Rigg & O'Dwyer, 2012) articulate the role of inspiration as a key factor of effective education for entrepreneurship. There are not many disciplines which, like educating for entrepreneurship, require contact with a mentor, a practitioner who can share their success story and experience and provide inspiration for personal life choices. Online teaching resources make that possible.

Massive Open Online Courses (MOOCs) open a new era in entrepreneurship education. Being characterized as flexible, open, self-directed, self-paced, highly interactive including peer learning, interdisciplinary and cost-reducing, MOOC bear a huge potential to cater the needs of future and existing entrepreneurs (Welsh & Dragusin, 2013). In addition, learning data collected provide completely new opportunities (learning analytics) for educators to reflect on and improve their teaching. Mondal, Kumar and Bose (2015) have stated the valuable opportunity of using MOOCs for entrepreneurial education and training especially for developing/emerging countries (in this case India). There, MOOCs can support the provision of high quality education for learners living at far-off places, help re-integrating school-dropouts and motivate learners towards entrepreneurship and starting their own business. As described earlier, this can again stimulate the economic growth, reduce poverty and improve the quality of life of the whole population. Of course, there are also obstacles mentioned such as high drop-out rates, lack of frequent (professor) feedback, cheating, or the difficulty to assess humanities including social sciences online (Welsh & Dragusin, 2013). However, MOOCs add a modern facet to the diverse spectrum of educational offers in the domain of entrepreneurship and open up access to education to millions of learners world-wide. The newer developments and tools (see chapter 2) are also reflected in the offers of entrepreneurship MOOCs, many of them applying tools such as the business model canvas or Design Thinking in their courses.

To summarize, entrepreneurship education today is not only extremely popular and accessible, but it is diverse, dynamic and exciting.

The existing popular online learning platforms (such as Coursera, edX, Udacity, Openlearning, Openlearn, Futurelearn, iversity, alison, Canvas Network etc.) offer a variety of MOOCs devoted to entrepreneurship, entrepreneurial skills and business start-up. These courses along with others existing on smaller platforms or websites have been analysed in order to identify best practices and most promising models within online entrepreneurship education.

5. International and European MOOCs on entrepreneurship

The existing on-line learning materials devoted to entrepreneurship vary greatly in their focus on subject area, audience, content, other features. Various entrepreneurship online courses have already been offered in the 2000s (e.g. MIT OpenCourseWare “Entrepreneurial Marketing” in 2002) and one of the first European MOOCs was devoted to idea creation and creativity (ThinkTank - Ideal City of the 21st Century by Leuphana Digital School in January 2013). However, in recent years we have observed an exponential growth rate of entrepreneurship MOOCs in the global educational landscape. According to Class Central, the number of MOOCs relating to business and management rose from 339 courses in 2014 to 1685 (!) courses in 2018 (as of 28 August 2018). With the vast amount of offerings and new MOOCs arriving at a constant rate, it is hard to pick and select a few good practice examples. Different online repositories facilitate a search for finding the current offerings, in an appropriate timeframe (or self-paced), language, didactical approach, workload, subtopic, quality, certification options etc.

Examples for online repositories are:

- Class central (<https://www.class-central.com/subject/entrepreneurship>). As of 28 August 2018, they list 238 entrepreneurship MOOCs (compared to 128 on 29 February 2016), of which 112 are future courses, 72 recently started or will be starting soon, and 49 are self-paced – which means, the majority are still or will be available and open for enrolment. Not all MOOCs listed are MOOCs in its closest definition as some of them ask for tuition fees. When classified by languages, English dominates (171 courses), followed by Spanish (26) and French (20). There is a rating system with reviews, however with an unequal distribution of user ratings per course (between 0 and 30), the meaningfulness could be questioned.
- The MOOC list (<https://www.mooc-list.com/tags/entrepreneurship?static=true>) provides an overview of 114 entrepreneurship MOOCs, as of 28 August 2018 (compared to 61 on 26 August 2016). The majority are the same MOOCs listed by Class central with only slight deviations.

In addition, there exist specific websites, reviews and blogs by MOOC learners on entrepreneurship MOOCs (such as “101 Free Online Business Courses + Certificate Options - Courses for Entrepreneurs, Small Business

Owners and Students”² by Dennis Mehaffey or “101 Best Online Business Courses for Entrepreneurs, Creatives and Professionals (Free & Cheap) in 2018”³ by Ryan Robinson), which could assist in the tough choice of selecting the appropriate MOOC to meet a person’s individual expectations, but also have to be critically reflected, as they only display a single learner’s perspective and could also potentially be advertising a specific course.

The joint analysis of the above repositories revealed an unequal distribution of entrepreneurship themes in existing online courses. To summarize, there is a large number of distinctive course types, differing in duration. Their design is quite inclusive and they are addressed to university students as well as to the general public. A dominant majority of the courses are in English.

Figure 2 below presents a graphic overview of the potentially most important types of courses relating to entrepreneurship for independent learners. Some of these are plentiful while others are very scarce in the existing online offer.

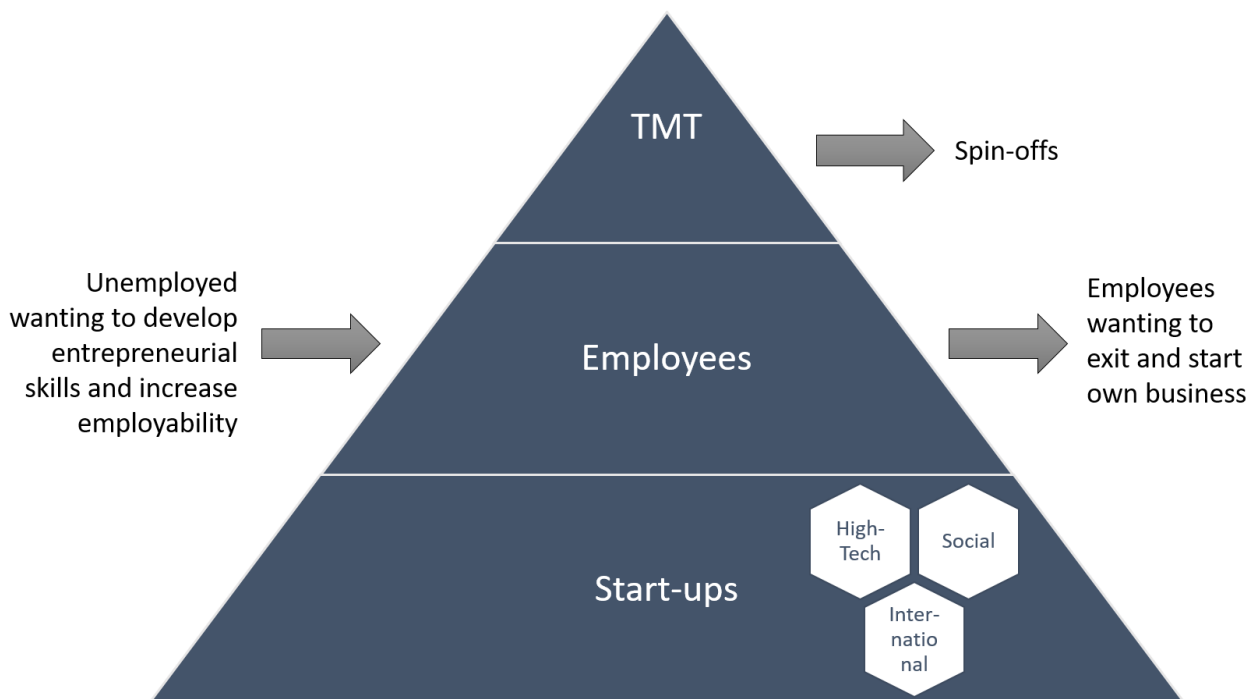


Figure 2. Types of online entrepreneurship courses. (TMT = Top Management Team)

² July 2018, <https://www.businessstudent.com/topics/101-incredible-free-online-business-courses/>

³ April 2018, <https://www.ryrob.com/online-business-courses/>

a) The existing offer of online entrepreneurship courses is greatly dominated by courses on start-ups (bottom of figure 2). Within this vast group of courses, most concentrate on universal start-up skills and processes necessary to successfully launch a business. Several thematic subgroups of courses have been identified relating to start-ups in a specific context. Among these a small number of courses focus on international new ventures (born-globals) and develop knowledge and skills typical for international entrepreneurship, others refer to social entrepreneurship and still others to high-tech start-ups.

Examples include:

- Developing Innovative Ideas for New Companies: The 1st Step in Entrepreneurship by University of Maryland, platform: Coursera
- Becoming an Entrepreneur by MITx, platform: edX
- Starting a business by University of Leeds, platform: FutureLearn
- Beyond Silicon Valley: Growing Entrepreneurship in Transitioning Economies by Western Reserve University, platform: Coursera
- Global entrepreneurship by Taylor's University, platform: Openlearning
- Changemaker MOOC - Social Entrepreneurship by Universität Kiel, platform: iversity
- Social Entrepreneurship by Copenhagen Business School, platform: Coursera
- Business Model Canvas: A Tool for Entrepreneurs and Innovators (Project-Centered Course) by University System of Georgia, platform: Coursera

Two of the above mentioned examples are presented below in greater detail, which the authors of this paper acknowledged to be of interest because of their topic, thematic focus and/or methodological approach.

→ **Developing Innovative Ideas for New Companies: The 1st Step in Entrepreneurship by University of Maryland, platform: Coursera**

<https://www.coursera.org/learn/innovative-ideas>

Throughout this course, participants can develop their entrepreneurial mindset and skill sets, learn how to bring innovations to market, and craft a business model to successfully launch their new business. In a four week course they will master Introduction to Innovation and Entrepreneurship, Entrepreneurial Mindset, Motivations, and Behaviours, Industry Understanding and Customer Understanding and Business Modelling. Each week includes Introduction, Video Lessons, Slides from Video Lessons, Challenge Activity, Further Readings and Resources (Optional) and Quiz. This was the most popular course on Class Central in 2014.

→ **Starting a business: realise your vision, by University of Leeds, platform: Futurelearn**

<https://www.futurelearn.com/courses/starting-a-business>

This interactive two-week course will provide the wide outlook into the numerous challenges and decisions that entrepreneurs face as they go through the process of starting a business. Enterprising students and graduates who have successfully started their own business will share their experience using video case studies, real life business plans and plenty of discussion. The course will help to see a good business opportunity and then take the participants through the steps of how to turn it into a successful business.

b) Several courses have been identified on up-scaling general entrepreneurial skills, as illustrated at the centre of the pyramid in figure 2. These are addressed to the general public and focus on developing creativity skills, opportunity recognition skills, time management skills, organizational skills and general management skills. These skills serve to reinforce entrepreneurial postures, enhance career development or to increase the employability of the unemployed.

Examples include:

- Design Thinking for Innovation, by University of Virginia, platform: Coursera
- Visual Thinking for Business - Make Your Point by WHU, platform: iversity
- Diploma in Business Management & Entrepreneurship – Revised 2017, by XSIQ, platform: Alison
- Entrepreneurial Strategic Management, by University of New Mexico, platform: Coursera
- Critical & Creative Thinking (V2), platform: Openlearning
- Cracking the Creativity Code: Discovering Ideas, by Israel Institute of Technology, platform: Coursera
- Grow to Greatness: Smart Growth for Private Businesses, Part I & II, by University of Virginia, platform: Coursera
- Strategic Planning and Execution, by University of Virginia, platform: Coursera
- Managing Responsibly: Practicing Sustainability, Responsibility and Ethics, by University of Manchester, platform: Coursera
- Valuing Companies, by University of Michigan, platform: Coursera

Again, two of the above mentioned examples are presented below in greater detail, which the authors of this paper acknowledged to be of interest because of their topic, thematic focus and/or methodological approach.

→ **Entrepreneurial Strategic Management, by University of New Mexico, platform: Coursera**

<https://www.coursera.org/learn/entrepreneurial-strategic-management/>

The course provided by University of New Mexico via the platform Coursera utilizes an inquiry-based approach with the aim of understanding sources of competitive advantages in companies and other

organizations. Video material as well as transcripts are available on the platform. After each model a quiz needs to be done and all graded assignments must be passed to finish the course.

→ **Design Thinking for Business Innovation, by University of Virginia, platform: Coursera**

<https://www.coursera.org/learn/uva-darden-design-thinking-innovation>

This course provides an overview of design thinking and works with a model containing four key questions and several tools to help learners understand design thinking as a problem solving approach. They also look at several stories from different organizations that used design thinking to uncover compelling solutions. The course includes readings, videos and a final reflection assignment.

c) The top part of figure 2, relating to firm-level entrepreneurship, remains still largely unaddressed by online education. Courses dedicated to enhancing general entrepreneurial skills fall into this category to some extent. Compared to the last version of this paper in 2016, there is now a clear trend of courses dedicated to creating an entrepreneurship friendly environment or an entrepreneurial orientation of companies and courses dedicated to facilitating entrepreneurial behaviour of companies in the form of radical innovation, spin-offs or high-risk investments. Similarly, the offer of courses dedicated to enhancing employee entrepreneurship (intrapreneurship) has been growing. However, responding to the lack of intrapreneurship online courses identified in 2016, the BizMOOC project team developed a specific intrapreneurship cMOOC, which launched in February 2018.

→ **Intrapreneurship - Make your Business great again, by BizMOOC project team, platform: mooc.house**

<https://mooc.house/courses/bizmooc2018>

The content of this course covers a clarification of the intrapreneurship concept, outlines its opportunities for companies and employees, and introduces different practical tools. It brings learners from different companies, countries and cultures together to discuss changes and challenges, and work on intrapreneurial ideas. It provides learners with tips and tools how to bring the entrepreneurial spirit to their organization, workplace or their team and boost their business through opportunity identification and exploitation. Learners can make use of readings, videos, quizzes, discussions and an optional group work of creating and pitching an idea. This MOOC was one out of three pilot MOOCs created by the Erasmus+ co-funded project “BizMOOC – Knowledge Alliance to enable a European-wide exploitation of the potential of MOOCs for the world of business” and is now available as a self-paced version (without pitch).

→ **Developing the Opportunity for Corporate Entrepreneurs, by University of Maryland, platform: coursera**

<https://www.class-central.com/course/coursera-developing-the-opportunity-for-corporate-entrepreneurs-7180>

In this course, learners will develop knowledge on how to navigate the barriers to creating, developing, and sustain innovative new businesses within large companies. These new businesses rarely fit neatly within well-established systems, processes, and cultures. Learners will develop the skills, and learn the tools and best practices, for identifying and developing the entrepreneurial opportunities, building business models, creating strategies for leading innovation, and financing innovation. This course is also part of a 5-course long specialization “Corporate Entrepreneurship: Innovating within Corporations Specialization” on Coursera.

Finally, several good practices which impact the quality and learner satisfaction have been identified in the analysis of the existing entrepreneurship online courses and from the experience of the pilot MOOCs:

- clear description of the course, its modules, learning goals and outcomes
- other incentives (idea pitch, competition, mentoring)
- high quality video/audio content (Stanford, MIT)
- e-books and high quality materials to download
- possibility to work in groups not only individually (SE course)
- interactions with instructor
- interactions with other participants to exchange ideas and experience (numerous tools available)
- multiple and diverse methods of evaluation,
- continuous feedback and tracking progress tools
- certificate or statement of participation.

Additionally, the research revealed that there a multitude of entrepreneurship courses exist and many new ones are emerging, catering to different individual needs, requirements and contexts. Suggested criteria for evaluating and choosing the right entrepreneurship course for one’s own needs are:

- Type of thematic content: learners should specify their needs regarding the course; whether acquiring start-up skills, general entrepreneurial skills or firm-level entrepreneurial practices and look for a course that will provide the best fit. The study revealed a wide choice of existing courses on various MOOC platforms, which suggests that learners need to be persistent in their search and not settle for second best.
- Provider: it is suggested to consider a high-ranked university, well-renowned professor, experienced private educational provider when choosing the course
- Language: study revealed that English language offers the widest choice of courses, followed by Spanish

- Length of course and workload necessary in order to complete the course
- Possibility to gain certification
- Costs: completely free of charge, partially free of charge or costly depending on the learner's preferences
- Possibility of submitting user feedback to the course
- Option to only choose certain modules / contents
- Moderated or not
- Possibility to work and interact with other learners
- xMOOC/cMOOC, Hybrid MOOC, SPOC, etc. or other format
- Mode of assessment

6. Recent MOOC Trends and the Rise of Micro-credentials

In 2016, several platforms have started to provide specific MOOCs offering transferable college credit to learners who are not enrolled in any of the corresponding university's programs. There are several collaborations between MOOC platforms and universities for the recognition of certificates and award of these kind of credits (such as EdX partnering with Arizona State University, offering full university fresh-level courses) and the number is rising constantly, which also affects digital entrepreneurship education offers (Lequerica, 2016).

In 2017, Georgia Tech and MIT for the first time offered their on-campus students the possibility of earning credits from a MOOC. Students could choose between enrolling in traditional on-campus courses or signing up for the same version available completely online. The results of these two pilots have been promising, MIT students rated the course as significantly less stressful compared to their on-campus classes. For online students, this could improve the credibility of non-credit certificates (Shah, 2017).

Shah (2018a) also identified several other MOOC trends in 2017. First of all, MOOC providers are still looking for a sustainable revenue model, from free courses, certificates, micro-credentials, university credits, online degrees to corporate training. Second, the number of completely free MOOCs is constantly shrinking, one of the core features that distinguished MOOCs from other forms of online education in the past. Third, MOOC providers have realized that their real audience are not universities and the higher education market but rather the labor market, in particular people who aim at achieving professional and career growth (also called "lifelong career learner"). Fourth, MOOCs have become increasingly flexible and convenient over the past years, adapting to the time constraints of many learners. Fifth, MOOC platforms have successfully entered into the markets for online degrees and corporate learning. Shah (2018b) stated that these two monetization models are what drives the revenue and fast growth of the big MOOC platforms, now and especially in the future. Coursera for example announced almost \$10M in tuition from their online degrees, recently offered the first MOOC-based Bachelor's Degree and has already more than 1000 corporate

partners (up from 30 in 2016 and 500 at the end of 2017). This will also heavily effect entrepreneurship education, there are already several online degrees in entrepreneurship available on the several MOOC platforms and corporates are increasingly using MOOCs for training and education of their workforce, such as intrapreneurship courses to foster employee innovation and the creation of ideas within their companies.

Finally, in the context of MOOCs and entrepreneurship education, another trend already mentioned is the rise of micro-credentials over the last two years. According to a report by CTQ and Digital Promise (2016), micro-credentials can be defined as a certification indicating demonstrated competency in a specific skill. Moreover, micro-credentials have four key characteristics: competency-based, personalized, on-demand and shareable.

Laurie Pickard (2018) recently published an analysis of 450 MOOC-based micro-credentials offered on five MOOC platforms (Coursera, edX, Udacity, FutureLearn and Kadenze). Pickard states that micro-credentials include more than a single course but are less than a full degree and can be seen as a response to the trend of modularity and stackability in higher education, enabling learners to basically create their own education “playlist”. However, Pickard concludes that the current offer of various micro-credentials lacks consistency and standardization, making it difficult to evaluate their significance and compare them, for both learners and employers. It is important to note that the majority of the offered micro-credentials by the 5 platforms is paid, with price ranges from a few hundred to a few thousand dollars. Learners can choose between payment for each course individually or pay upfront for the whole series, receiving a small discount.

Micro-credentials on the Market Today

Platform	Micro-credentials
Coursera	Specialization, MasterTrack Certificate, Professional Certificate
edX	XSeries, MicroMasters, Professional Certificate
Udacity	Nanodegree
FutureLearn	Program, Graduate Certificate, Graduate Diploma
Kadenze	Program

Table 1: Micro-credentials on the Market Today (after Pickard, 2018)

Building on Pickard’s (2018) 11 identified types of micro-credentials on the MOOC platforms Coursera, edX, Udacity, FutureLearn and Kadenze (as summarized in table 1), we conducted follow up research focusing on micro-credentials in the area of entrepreneurship. Annex 1 illustrates the identified entrepreneurship micro-credentials on the 5 selected MOOC platforms. Summarizing annex 1, Coursera (9 English, 2 Spanish, 1 French) and edX (7 English, 1 Spanish) are the two leading providers of entrepreneurship micro-credentials of all 5 platforms evaluated. FutureLearn and Kadenze only offer one micro-credential respectively (both in English) and Udacity does not offer any micro-credential in the area of entrepreneurship at all (as of August 28, 2018). The following part shortly describes three best practice micro-credentials currently available,

which the authors of this paper acknowledged to be of interest because of their topic, thematic focus and/or methodological approach.

→ **Entrepreneurship (Specialization), created by Wharton School of the University of Pennsylvania, platform: Coursera**

<https://www.coursera.org/specializations/wharton-entrepreneurship#creators>

Wharton's Entrepreneurship Specialization covers the conception, design, organization, and management of new enterprises. This four-course series is designed to take learners from opportunity identification through launch, growth, financing and profitability. With guidance from Wharton's top professors, along with insights from current Wharton start-up founders and financiers, learners develop an entrepreneurial mindset and hone the skills they need to develop a new enterprise with potential for growth and funding, or to identify and pursue opportunities for growth within an existing organization.

→ **Business Principles and Entrepreneurial Thought (XSeries), created by Babson College, platform: edX**

<https://www.edx.org/xseries/business-principles-entrepreneurial>

Making good business decisions can make or break an entrepreneur. This business and management XSeries consists of 6 courses and explores topics such as financial accounting, analytics, customer behavior, and strategy all with the lens of an entrepreneur who has to make critical decisions for the success of the business. Learners should realize how entrepreneurial thinking can be applied to any business environment and get an understanding of entrepreneurial thought and action.

→ **Social Enterprise (Program), created by Middlesex University Business School, platform: FutureLearn**

<https://www.futurelearn.com/programs/social-enterprise>

This program is intended for anyone interested in learning more about social enterprise, including entrepreneurs, charities and students. By the end, learners will be able to: explore the diverse world of social enterprise, evaluate social enterprise ideas, design social enterprise models and apply them in the market, assess sources of funding and investment, measure social impact and produce a plan to scale and sustain social enterprises.

To conclude, it becomes clear that many of the popular MOOC platforms, such as Coursera and edX, are already providing several entrepreneurship micro-credentials and the offer is constantly rising. Even though platforms like Udacity, FutureLearn and Kadenze offer various micro-credentials for many subjects, they still lag behind when it comes to micro-credentials on entrepreneurship education and training. Moreover, the problem of standardization and variability, as identified by Pickard (2018), can also be confirmed for the

current offer of entrepreneurship micro-credentials. As a result, learners and employers are facing barriers when it comes to the comparison of different entrepreneurship micro-credentials offered by the various MOOC platforms. Nevertheless, the micro-credentials trend clearly responds to the needs and preferences of learners and employers looking for modularity, stackability and competence based education (Matkin, 2017).

7. Conclusions

Starting a business is similar to an athletic endeavor, like serving a tennis ball. Telling you how to do it is useless. Do you really want to know how to raise \$1 million? Go out and raise \$100k from friends, family and fools.(Yang, 2016)

Entrepreneurship courses themselves are a strong current trend in the global MOOC movement (see chapters 5 and 6). Their volume is growing continuously. There is already a competition going on between providers to attract learners which will be reinforced by the great number of entrepreneurship MOOCs and newer formats such as the micro-credentials and full online degrees. The question will be how these offerings differentiate from each other and if the areas of company-level entrepreneurship, intrapreneurship and enlarging/furthering existing entrepreneurial skills will be tackled by MOOCs and follow-up formats. In general, a shift can already be recognized towards self-paced and regularly recurring courses. There are also tendencies to apply the original definition of MOOCs as free courses towards fee-required courses, as more and more content gets locked behind paywalls. As the education sector itself is currently disrupted by entrepreneurship, innovation pressure and digitalization processes, it also has several impacts on entrepreneurship education, such as changing business and revenue models or content delivery channels. Today, the online entrepreneurship education sector is clearly dominated by several American MOOC platforms and content created by American universities and business schools, strongly affecting entrepreneurship education in general on a global level.

The research has identified the main topics of existing online courses devoted to entrepreneurship, which are: start-ups and universal entrepreneurial skills. Compared to the first version of this paper, the number of courses in the area of corporate entrepreneurship has grown, as it clearly responds to the need of fostering entrepreneurial orientation within companies. Even though course topics and contents within entrepreneurship courses are extremely diverse, the focus is now clearly on entrepreneurship FOR entrepreneurs, using innovative tools, such as Business Canvas and Lean Approaches. Such tools have proven to be not only successful and applicable in the area of start-ups but also for corporates looking for constant innovation.

Nevertheless, the analysis has shown that course titles and descriptions not always reflect the actual content of MOOCs (e.g. mixing up idea generation and business modelling or firm-level entrepreneurship, corporate entrepreneurship and intrapreneurship). Many entrepreneurship courses also follow the same structural pattern, such as the development of canvas and a follow-up pitch by learners. This raises the question of whether this actually represents a useful and valuable application of learnings in entrepreneurship courses.

Finally, the concept of failure is missing from the MOOC agenda. Taken that many successful entrepreneurs have failed before, it is surprising that most education systems around the world do not embrace failure. Instead, millions of learners are successfully completing entrepreneurship courses every year. This might lead potential entrepreneurs to believe that starting a business is simple, requires no big effort and commitment and that success comes naturally. Even worse, failure-free entrepreneurship education can potentially promote the failure of people who are just not suitable for being an entrepreneur. This is important to keep in mind when we analyse the growing volume of entrepreneurship on-line courses.



Platform	Micro-credential Type	Title	Creator	No of courses	Required time effort	Language
Coursera	Specialization	Entrepreneurship	University of Pennsylvania	5	42 hours	English
		Social Entrepreneurship	Copenhagen Business School	3	43 hours	English
		Entrepreneurship: Launching an Innovative Business	University of Maryland	4	43 hours	English
		Corporate Entrepreneurship: Innovating within Corporations	University of Maryland	5	64 hours	English
		Doing Business in China	The Chinese University of Hong Kong	4	49 hours	English
		Startup Entrepreneurship	Technion - Israel Institute of Technology	4	62 hours	English
		How to Start Your Own Business	Michigan State University	6	108 hours	English
		L'impact investing, la finance qui change le monde	ESSEC Business School	4	36 hours	French
		Value Creation Through Innovation	EIT Digital	5	106 hours	English
		Finanzas corporativas	Universidad Nacional Autónoma de México	6	57 hours	Spanish
edX	Professional Certificate	Programa en Desarrollo de nuevas empresas	Universidad de los Andes	4	57 hours	Spanish
		Innovation Management and Entrepreneurship	HEC Paris	12	160-400 hours	English
	XSeries	Business Principles and Entrepreneurial Thought	Babson College	6	96-144 hours	English
	MicroMasters	Entrepreneurship	Indian Institute of Management Bangalore	4	96-264 hours	English
		Corporate Innovation	The University of Queensland	5	200-500 hours	English
	Professional Certificate	Managing Technology & Innovation: How to deal with disruptive change	RWTH Aachen University	6	216-360 hours	English
		Empresas familiares: emprendimiento y liderazgo para trascender	Tecnológico de Monterrey	2	n.a.	Spanish
		Fintech	University of Hong Kong	3	18-54 hours	Spanish
		Entrepreneurial Mindset and Leadership	Babson College	4	64-96 hours	English
	Program	Business Model Innovation	Delft University of Technology	4	48-160 hours	English
		Social Enterprise	Middlesex University Business School	3	36 hours	English
Future Learn	Program	Money Matters for Creative Entrepreneurs	Columbus College of Art & Design	3	144 hours	English

References

1. Analytical Report *Entrepreneurship in the EU and Beyond*, European Commission, Flash Eurobarometer, 2010, No. 283.
2. Antoncic, B & Hisrich, RD 2001, 'Intrapreneurship: construct refinement and cross-cultural validation', *Journal of Business Venturing*, vol. 16, no. 5, pp. 495-527.
3. Blank, S. (2005). *The Four Steps to the Epiphany: Successful Strategies for Startups That Win*. K & S Ranch.
4. Blank, S. G., & Dorf, B. (2012). *The startup owner's manual: The step-by-step guide for building a great company*. Pescadero, Calif: K & S Ranch, Inc.
5. Dess, GG & Lumpkin, GT 2005, 'The role of entrepreneurial orientation in stimulating corporate entrepreneurship. Research briefs', *Academy of Management Executive*, vol. 19, no. 1, pp. 147-156.
6. Dickson, P, Solomon, G, Weaver, KM 2008, 'Entrepreneurial selection and success: Does Education matter?' *Journal of Small Business and Enterprise Development*, vol. 15, pp. 239-258
7. Di-Masi, P. 2010, 'Defining Entrepreneurship: What is Entrepreneurship?': <http://www.gdrc.org/icm/micro/define-micro.html>
8. Drucker, P.F. (1985). *Innovation and entrepreneurship*. New York: Harper & Row
9. Elert, N., Andersson, F. W., & Wennberg, K. (2015). The impact of entrepreneurship education in high school on long-term entrepreneurial performance. *Journal of Economic Behavior & Organization*, 111, 209-223.
10. European Commission. (2013). *Entrepreneurship 2020 action plan: reigniting the entrepreneurial spirit in Europe*.
11. European Parliament and Council 2006, Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning. *OJ L 394*, 30 December 2006, pp. 10-18.
12. FFE-YE. (2012). *Impact of Entrepreneurship Education in Denmark - 2011*. In L. Vestergaard, K. Moberg & C. Jørgensen (Eds.). Odense: The Danish Foundation for Entrepreneurship - Young Enterprise.
13. Gorman, G., Hanlon, D., & King, W. (1997). Some research perspectives on entrepreneurship education, enterprise education and education for small business management: a ten-year literature review. *International small business journal*, 15(3), 56-77.
14. Jenner, C. (2012). Business and education: powerful social innovation partners. *Social Innovation Review*.
15. Jones, GR & Butler, JE 1992, 'Managing internal corporate entrepreneurship: An agency theory perspective' *Journal of Management*, vol. 18, no. 4, pp. 733-749.
16. Kanter, RM 1985, *The Change Masters*, Unwin
17. Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship education: 1876-1999. *Journal of business venturing*, 18(2), 283-300.
18. Katz, J. A. (2014). Education and training in entrepreneurship. In *The psychology of entrepreneurship* (pp. 241-268). Psychology Press.

19. Kuratko, D F 2005, 'The emergence of entrepreneurship education: development, trends and challenges'. *Entrepreneurship Theory and Practice*, vol. 29, no. 5, pp. 577-598
20. Matkin, W. G. (2017). Why Digital Credentials Will Render University Transcripts Obsolete and Reshape Higher Education. Retrieved August 28, 2018, from <https://unbound.upcea.edu/innovation/alternative-credentialing/why-digital-credentials-will-render-university-transcripts-obsolete-and-reshape-higher-education/>
21. 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.
22. McClure, D. (2010). MoneyBall For Startups: Invest BEFORE Product/Market Fit, Double-Down AFTER 500 Startups, in Business Insider, as of Aug. 4, 2010, Retrieved 29 August from <https://www.businessinsider.com/moneyball-for-startups-invest-before-productmarket-fit-double-down-after-2010-8?IR=T>
23. Miller, D 1983, 'The correlates of entrepreneurship in three types of firms', *Management science*, vol. 29, no. 7, pp. 770-791.
24. Mwasalwiba, ES 2010, 'Entrepreneurship Education: a review of its objectives, teaching methods and impact indicators', *Education and Training*, vol. 52, no. 1, pp. 20-47.
25. Osterwalder, A., Pigneur, Y., Bernada, G., Smith, A., Papadakos, T. (2014): Value Proposition Design: How to Create Products and Services Customers Want (Strategyzer), John Wiley & Sons, Inc.
26. Pickard, L. (2018, July 18). Analysis of 450 MOOC-Based Micro-credentials Reveals Many Options But Little Consistency. Retrieved August 28, 2018, from <https://www.class-central.com/report/moocs-micro-credentials-analysis-2018/>
27. Pinchot, G 1985, *Intrapreneuring: Why You Don't Have to Leave the Corporation to Become an Entrepreneur*, University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. Available at SSRN: <http://ssrn.com/abstract=1496196>
28. Pittaway L & Cope J 2007, 'Entrepreneurship education: a systematic review of the evidence', *International Small Business Journal*, vol. 25, no. 5, pp. 479-510;
29. Rae, D 2005, 'Entrepreneurial learning: a narrative-based conceptual model', *Journal of Small Business & Enterprise Development*, vol. 12, no. 3, pp. 323-35.
30. Rae, D 2010, 'Universities and enterprise education: responding to the challenges of the new era', *Journal of Small Business and Enterprise Development*, vol. 17, no. 4, pp. 591-606
31. Raposo, M & Paco, A 2011, 'Entrepreneurship education: relationship between education and entrepreneurial activity', *Psicothema*, vol. 23, no. 3, pp. 453-457.
32. Ries, E. (2011). The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. New York: Crown Business.
33. Ries, E. (2017). The Startup Way: How Modern Companies Use Entrepreneurial Management to Transform Culture and Drive Long-term Growth, Currency, 2017.
34. Rigg C & O'Dwyer, B 2012, 'Becoming an entrepreneur: researching the role of mentors in identity construction', *Education and Training*, vol. 54, no. 4, pp. 319-329.

35. Shah, D. (2018a, January 22). A Product at Every Price: A Review of MOOC Stats and Trends in 2017. Retrieved August 28, 2018, from <https://www.class-central.com/report/moocs-stats-and-trends-2017/>
36. Shah, D. (2018b, April 9). MOOCWatch #17: MOOCs Become Big Business. Retrieved August 28, 2018, from <https://www.class-central.com/report/moocs-become-big-business/>
37. Shane, SA 2000, *A general theory of entrepreneurship: The individual-opportunity nexus*. Edward Elgar Publishing.
38. Shane, S & Venkataraman, S 2000, 'The promise of entrepreneurship as a field of research', *Academy of Management Review*, vol. 25, no. 1, pp. 217–226.
39. Solomon, G.T., Duffy, S., & Tarabishy, A. (2002). The state of entrepreneurship education in the United States: A nationwide survey and analysis. *International Journal of Entrepreneurship Education*, 1(1), pp. 65–86.
40. Stevenson, H. H & Jarillo, J C 1990, 'A paradigm of entrepreneurship: Entrepreneurial management', *Strategic Management Journal*, vol. 11, no. 5, pp. 17-27.
41. Stevenson, L. & Lundström, A. 2001, 'Patterns and Trends in Entrepreneurship/SME Policy and Practice in ten Economies', *Entrepreneurship Policy for the Future Series*, vol. 3, pp. 11-32.
42. Timmons J.A 1985, *New Venture Creation*, Homewood Illinois
43. Venkataraman, S, Sarasvathy, SD, Dew, N, & Forster, WR, 2012, 'Reflections on the 2010 AMR decade award: Whither the promise? Moving forward with entrepreneurship as a science of the artificial', *Academy of Management Review*, vol. 37, no. 1, pp. 21-33.
44. Viki, T., Toma, D., & Gons, E. (2017). The Corporate Startup: How established companies can develop successful innovation ecosystems, Vakmedianet.
45. Von Graevenitz, G., Harhoff, D., & Weber, R. (2010). The effects of entrepreneurship education. *Journal of Economic Behavior & Organization*, 76(1), 90-112.
46. Welsh, D. & Dragusin, M. (2013). The New Generation of Massive Open Online Course (MOOCS) and Entrepreneurship Education. *Small Business Institute Journal*, 2013, Vol. 9, No. 1, 51-65.
47. Yang, A. (2016, February 25). Why Entrepreneurship Education Does Not Work. Retrieved August 29, 2018, from <https://www.forbes.com/sites/andrewyang/2016/02/25/entrepreneurship-education-does-not-work/>
48. Zahra, SA & Kuratko, DF, 1999, 'The antecedents and consequences of firm-level entrepreneurship: the state of the field', *Entrepreneurship Theory and Practice*, vol. 24, no. 2, pp. 45-65.
49. Zur, Agnieszka, 2014, 'Entrepreneurial education for social responsibility', *Przedsiębiorczość - Edukacja*, vol. 10, pp. 346-353.