

MOOCs for innovative entrepreneurship in smart cities

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Suggested Citation:

Holotescu, C., Slavici, T., Cismariu, L., Gotiu, L., O., L., Grosseck, G., & Andone, D. (2016). MOOCs for innovative entrepreneurship in smart cities. *World Journal on Educational Technology: Current Issues*. 8(3), 245-251.

Received June 26, 2016; revised July 22, 2016; accepted September 03, 2016

Selection and peer review under responsibility of Assoc. Prof. Dr. Fezile Ozdamli, Near East University.

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Abstract

Started in 2008, the new Massive Open Online Courses (MOOCs) paradigm has brought challenges and innovation at all levels of education, aiming to respond to the most pressing learning needs, generated by the new development policies and the rapid evolution of technology. This paper reports on a project proposed by a group of universities and organizations specialized in training, research and consultancy, with a view to develop and implement an innovative learning system in entrepreneurship. The project is built on a package of MOOCs targeting the learning needs of young entrepreneurs in the context of „Smart cities” policies. The article presents the project concepts, and the development and implementation steps, from MOOCs design, pilot phase, consultancy activities, impact study to proposals for national policies and accreditation. This work could be a starting point for developing new programmes and customized training courses on specific learning needs to support the „Smart cities” interventions.

Keywords: Smart Cities, Entrepreneurship, MOOCs, Innovation, Smart Citizens;

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1. Introduction

According to the United Nations studies, in 2008, for the first time in history, more than half of the world's population lived in urban areas. Moreover, virtually all of the future growth of the world's population, from 54% in 2015 to 60% in 2030, will take place in cities (UN, 2016). At the same time, although the overall population of Europe is projected to decline and in spite of hosting the largest number of international migrants in 2015, 76 million (UN, 2016), the European urbanization will increase from 73.6% in 2015 to 75.8% in 2025 (GeoHive, 2016).

Therefore, urban areas worldwide require new and innovative ways to deal with the complexity of living and overcrowding, energy consumption, resource management and environmental protection (Manville et al., 2014). They must also focus to succeed in becoming more intelligent, better connected and more open (Siso, 2015), thus "Smart Cities", requiring smart managers, entrepreneurs and citizens to achieve all these aims.

2. Definitions of Smart Cities. Connection with Entrepreneurship and Education

In Europe, where urban areas generate approximately 85% of the EU Gross domestic product (GDP), Smart Cities represent a priority for the European Commission. A recent EU study established as working definition of a Smart City: "a city seeking to address public issues via ICT-based solutions on the basis of a multistakeholder, municipally based partnership" and mapped the cities fitting this definition across the Member States (Manville et al., 2014).

The concept of "Smart City" is dynamic and often context dependent, being an organic connection between technological, human and institutional components. A comprehensive list of definitions can be found in (Nam and Pardo, 2011; Manville et al., 2014). Buchem and Pérez-Sanagustín (2013) consider that Smart Cities are "complex ecosystems supported by technological infrastructures transforming citizen engagement, learning and participation", and also that "smart cities cannot be smart without smart citizens".

Various instruments for assessing the "smartness" of cities and their contribution to competitiveness and well-being of the people have been created. An important and well-known project, called European Smart Cities (<http://www.smart-cities.eu>), coordinated by the Centre of Regional Science, Vienna University of Technology, which started in 2007 and is still in implementation, published the 4th version of the Smart City Model last year. A Smart City is well performing in "six key fields of urban development, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens" (Giffinger et al., 2007). The six interconnected characteristics of a Smart City Model 4.0 are smart economy, smart environment, smart governance, smart living, smart mobility and smart people, which are broken down in 31 factors and 74 corresponding indicators (ESC, 2015).

Citizens' capabilities are among the factors measuring smart economy and smart people, such as entrepreneurship, innovative spirit, qualification, affinity to lifelong learning, flexibility or creativity. The model uses indicators relevant to learning, innovation and entrepreneurship, such as: employment rate in knowledge intensive sectors, patent applications per inhabitant, self employment rate, new businesses registration, and participation in lifelong learning.

One can note that the Smart Economy and Smart People characteristics demand an innovative education system to produce smart, adaptable and continuing learning entrepreneurs and citizens, while Entrepreneurship and Education represent real pillars of future city smartness.

In the policy context of Europe 2020, higher education institutions (HEIs) and research organizations (ROs) play key roles in Innovation, Education, and the Digital Agenda, which are all initiatives for smart growth. At large, this means that these institutions are responsible for key

activities such as human capital and skills development, knowledge transfer, innovation and enterprise formation, and wider community development (Fotakis et al., 2014).

3. Smart Cities Initiatives in Romania

In Romania, there are various programmes that offer public funds for the development of “Smart cities”. The Regional Operational Programmes 2007-2013 funded interventions for urban development, including smart cities infrastructure, provided that the concept is transposed into the city strategic planning (<http://www.inforegio.ro>). Other operational programmes, such as the Human Resources Development Sectoral Operational Programme for education and training, the Increase of Economic Competitiveness Sectoral Operational Programme for research development and innovation, the Administrative Capacity Development Operational Programme for governance could have funded other “smartness” dimensions and factors. 2014-2020 European funds continue to support the development of smart cities through the successors of the above-mentioned programmes. Additional funding is available from the European Commission through other programmes, such as Horizon 2020 and COSME. The challenge for the cities, their governments and the relevant stakeholders remains their ability to design integrated measures addressing all elements of the cities’ “smartness” and implement them in a coherent and synergic manner.

The literature reveals the first attempts to support strategic approaches for the development of Smart cities in Romania in 2013, when a national strategy for Smart cities was discussed and initiated. It was pointed out that “there are no smart cities without smart people”, and also that “the process of governing smart cities is based on a continuous dialogue between institutions, enterprises, research/universities and different other stakeholders, which need a space to interact – a smart cities platform” (Elisei and Dimitriu, 2013; <http://urbasofia.eu/ro>). An Association of smart cities was launched with the support of some key stakeholders, such as the National Institute for Research and Development in Constructions, Urban and Sustainable Territorial Development.

A few isolated Romanian initiatives were presented during the debates, starting with the city of Timisoara, which focuses on a smart transport approach, followed by Sibiu, which aims to implement the smart grid concept, and also by Craiova. These three Romanian towns were also assessed in a ranking of European medium-sized cities published in 2007: all three cities scored best on “smart environment”, but had lower scores on smart economy and smart people dimensions (Giffinger, R. et al., 2007).

In the autumn of 2013, a very active Smart City Association was launched in Timisoara, meant to develop the software infrastructure of the city, based on open data. Thus, with the support of the City Hall, it became the first Romanian town “to publish datasets on the national open data portal and the first to issue a regulation framework for official open data activities” (<http://www.mysmartcity.ro>).

4. Entrepreneurship in Romania. The need for innovation

Currently there is no consensus in Europe on what makes an entrepreneur, thus some current projects and studies aim at developing a European reference framework that defines the key Competence for lifelong learning „Sense of Initiative and Entrepreneurship (EntreComp)” and the Indicators on Entrepreneurial Learning and Competence (JRC, 2015; Henry and Chatzichristou, 2014).

The Entrepreneurship 2020 Action Plan, launched by the European Commission (EC) in 2013, after identifying some of the barriers for entrepreneurs, such as the image of entrepreneurship, heavy bureaucracy and various financial constraints, has shown the importance of entrepreneurial education and training in supporting growth and business creation.

In order to facilitate networking and support new business ideas, a European Mentors Network for training, advice and coaching is going to be created, but such a network has not been implemented yet.

The action plan also mentions the need to stimulate the development of Massive Open Online Courses meant for fostering web entrepreneurship and also to set up platforms for mentoring and skill building.

In Romania, the Human Capital Operational Programme 2014-2020 is supporting entrepreneurship interventions with European and Structural Investment Funds, in order to address a key weakness of the country's competitiveness, the reduced entrepreneurial culture, which generates a low density of SMEs, much below the European average.

A recent study (Curaj et al., 2015) confirms this weakness and highlights the factors that affect entrepreneurship, such as low quality of management and entrepreneurial education, and a small number of opportunity-driven entrepreneurs. Among the study recommendations, we mention the targeted support for the development of high quality education in management and entrepreneurship programmes.

5. Open Education and MOOCs. Romanian Initiatives

Throughout the years, a variety of EU institutions, organizations or foundations were engaged in launching initiatives for programmes and projects related to Open Education, seen as „a mode of realizing education enabled by digital technologies aiming to widen access and participation to everyone, offering multiple ways of teaching and learning, building and sharing knowledge, as well as a variety of access routes to bridge formal and non-formal education” (OpenEdu, 2015).

Started in 2008, the new Massive Open Online Courses (MOOCs) paradigm, a core key of Open Education, has brought challenges and innovation at all levels of education, aiming to respond to the most pressing learning needs, generated by the new development policies and the rapid evolution of technology.

In Romania there are many initiatives related to MOOCs (Holotescu, 2012):

- implementation of platforms and MOOCs (unicampus.ro, novamooc.uvt.ro, mooc.ro, unibuc-virtual.net, eliada.ubbcluj.ro/proiect, udemy.com/management-ong, estudent.ro);
- experiments for integrating MOOCs in blended academic courses can be found at the Politehnica University of Timisoara and the University „Ioan Slavici” of Timisoara (Holotescu et al., 2014; VasIU and Andone, 2014);
- workshops and national conferences on open education organized by the Romanian Coalition for OERs.

6. Steps for Innovative Entrepreneurship in Smart Cities using MOOCs

Presently, entrepreneurship is a topic for many courses delivered at all levels of education, from pre-university to university and continuous education. Most of them are based on a traditional teaching paradigm, and are not connected with the current EU priorities and with the needs of cities (European Commission/EACEA/Eurydice, 2016; Curaj et al., 2015).

The group of universities and organizations specialized in training, research and consultancy, coordinated by the authors of this paper, already have experience in MOOCs development and integration (Holotescu et al., 2014; VasIU and Andone, 2014), and in assessing the learning needs of Smart Cities (Grosseck et al., 2014; Andone et al., 2014).

The partners are working on implementing an Entrepreneurship Learning Programme, consisting of a training network that uses MOOCs, also providing (massive) mentoring/coaching and support for finance finding.

The trainees should be prepared to become informed, creative and hyperconnected entrepreneurs, to actively participate, collaborate, and develop the activities, decisions and economies of cities.

The development of MOOCs uses the structured design and quality criteria (Ebner et al., 2014; Warburton and Mor, 2015).

The project's steps are presented below:

- Input for entrepreneurial MOOCs design: the first phase aims to define the specific competencies for Smart City entrepreneurs, starting with a research that comprises: EU priorities and studies, analysis of the training needs and the existing Entrepreneurship courses and MOOCs, collection of Social Media data, interviews and experience of partners, understanding different expectations of Smart City stakeholders (universities, public administration, NGOs, business companies, professional communities, citizens).
- Publish the previous results as open data by using open CC licenses.
- MOOC to train MOOC facilitators: only some of the teachers and trainers who will develop the project MOOCs already have experience in using Open Educational Practices (OEPs) and in developing and facilitating online courses; thus they will take part in a MOOC specially designed for preparing MOOC facilitators, which will be open for other participants as well. The topics of this MOOC will concern Open Education, CC licenses, OEPs, OERs and MOOCs, and scenarios for integrating them in traditional courses.
- Implement and pilot Entrepreneurship MOOCs: MOOCs are developed as blended courses, integrating Open Educational Resources and Practices, gamification for Entrepreneurship, study cases. A badge system will be used for different levels of completion; participants who will complete all tasks will receive a participation certificate.
- Follow up activities: monitor the activities of trainees, run face-to-face and online consultancy activities, consisting in experiments for Massive Open Online Consultancy (MOOCo); the project platform could be the space for a community of practice of actors involved in Open Education, Entrepreneurship for Smart Cities, representing the basis for Massive Open Online Research (MOOR); offer connections with events, startup incubation and seed funding/crowdfunding programmes (<http://ree.uefiscdi.ro/funding-resources>); at least a percentage of the ideas/projects developed collaboratively during the MOOCs should take part in hackathons and participate in seed funding programmes.
- Impact study and empowerment evaluation: define the evaluation metrics for the developed MOOCs, such as the trainees' abilities and knowledge, networking connections, number of created Smart City applications.
- Pack MOOCs as nano-degrees or specializations included in formal and informal training programmes, also in Master programmes; during the pilot project, MOOCs will run as optional courses for students in the partners' universities.
- Develop a set of proposals for national policies and accreditation system.

The partners are currently involved in the first research phase, necessary to prepare the design and curricula of the MOOCs for Entrepreneurs and also for the third phase, designing the MOOC meant to train the trainers of the project. In an extended partnership, we intend to apply for a grant in order to implement the envisioned project.

7. Conclusions

Started as an initiative of a few universities and training, research and consultancy organizations willing to modernize and update their entrepreneurship education offers, we consider that our project could become one of the strategic programmes in the Western region of Romania, involving other cities and regions with similar strategies. Moreover, this project could respond to the findings of the recent exploratory study related to the Romanian Entrepreneurial Ecosystem (Curaj et al., 2015).

We estimate that our project has the following impact:

- It could contribute to the openness movement, spreading the knowledge and benefits of open education and enlarging the communities of practice around OERs, MOOCs, OEPs and open licenses;
- The participants in the project MOOCs could become real smart entrepreneurs of their cities and regions;
- The project could bring a real impact in innovation, in research and in creating smart citizens.

Acknowledgements

This work was partially supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS - UEFISCDI, project number PN-II-RU-TE-2014-4-2040: NOVAMOOC - Development and innovative implementation of MOOCs in Higher Education.

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