



MOOCs
“ for the world
of business

BizMOOC Discussion paper 12

Fostering Innovation and Creativity through
MOOCs

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Fostering Innovation and Creativity through MOOCs

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

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Fostering Innovation and Creativity through MOOCs

Authors: Michael Obrist (iversity) Mariya Zheleva (Burgas Free University, Bulgaria)

1. Summary

There are various factors for the exponentially increasing popularity of MOOCs. Some of the most important ones are the format and pedagogical base (Bersin, J., 2013, Lackner&Kopp, 2014, Shah, D., 2014) which consider MOOCs to be very suitable for teaching and learning of concepts, methods and theories, for obtaining practical skills and competences and last but not least, for boosting the sense of innovation and the creativity of the educational process participants. Moreover, MOOCs offer a diverse community of participants the opportunity to share ideas and get deeply involved in the subject via a rich variety of synchronous and asynchronous online activities. In this article, some of the most important determinants of successful MOOCs on creativity and innovation are outlined. Some examples are briefly presented and a long list of selected courses is provided in the appendix of the article.

2. Creativity and Innovation in Education - European Perspective

In the final report of the project: 'Creativity and Innovation in Education and Training in the EU27 (ICEAC)', carried out by the institute for prospective technological studies (IPTS) in collaboration with DG Education and Culture, it is highlighted that "there is a growing need for action in both national and European level to bring about the necessary changes required for an open and innovative European education culture based on the creative and innovative potential of its future generations" (Cacha R. et al. 2010).

The report outlines the "importance of the creativity and innovation in addressing the economic, environmental and social crises" and brings evidence that EU policies call for the "...strengthening of Europe's innovative capacity and the development of a creative and knowledge-intensive economy and society through reinforcing the role of education and training in the knowledge triangle and focusing on creativity, innovation and entrepreneurship...".

3. The Potential of MOOCs for Innovation and Creativity Centred Education

According to Norvig (2012), MOOCs have had a remarkable ability to attract large numbers of learners to a vigorous online learning community. The constant availability makes MOOCs an excellent resource not only for students, but also for all life-long learners and modern professionals striving for on-going career development and personal improvement. MOOCs have always been a great format to exchange ideas among participants, to study and develop creative processes and foster innovation. This is due to several

factors, including the fact that participants in Massive Open Online Courses are usually very diverse. The fact that these courses are provided for free or at low prices (which is their other big advantage) enables both people with no formal education and those with a degree from a higher education institution to be able to embrace the opportunities (Green S. 2015).

Unlike the traditional classroom setting at a university, participants from all over the world, at any age and with different interests, abilities and backgrounds can enrol in an online course. Furthermore, studying in a MOOC is a combination of synchronous and asynchronous activities in the online format. This gives participants the ability to receive input from the teacher in the course, reflect on the topic at different places and times and interact with the course community subsequently. Depending on the pedagogical design of the online course and the platform features, one can substantially increase participants' innovation and creative outputs by simply enabling them to unleash their creative potential.

Some of the most important factors are the format and pedagogical base which make MOOCs very suitable for teaching and learning concepts, methods and theories, for obtaining practical skills and competences, as well as for boosting the sense of innovation and the creativity of the learners.

The online format allows learners to explore dozens, yet hundreds of contributions by other course participants, which often leads to further inspiration for their own work in creative assignments. Taking all the above into consideration, we can conclude that MOOCs could play a key role in fostering and developing people's creative and innovative capacities for further learning and in their working lives.

4. Determinants of successful MOOCs on Creativity and Innovation

Course Community

A vital course community that enables social learning is a key for MOOCs on creativity and innovation. Successful MOOCs in this field have engaged and socially active communities of students/learners that pose problems, solve questions, add additional material to the class, and support other students' learning. MOOCs are designed to allow users to learn by themselves. A focus is put on interactive assignments, e.g. a peer evaluation process of essays, projects or other contributions. Scalability and the creation of an engaging and interesting learning experience is also key. An engaged community with a pool of creative minds can stimulate learners and high-quality peer-to-peer feedback can motivate them to contribute creative assignments themselves. Especially since creative assignments rarely have a "right vs. wrong" answer, well-structured peer feedback is often as good as expert feedback.

It must be noted that the quality of the discourse is very important to the learner experience. An active community does not equal a good community and low quality peer feedback and discussions can lead to frustration and disengagement of the learners.

Moderation, Feedback and Support by Community Manager and Course Mentor

In order to set up an active course community, it pays to have active moderators (community managers, course mentors, teachers) to start discussions, give feedback and guidance. Due to the huge number of MOOC learners, the customization to the particular needs or preferences of each learner is a real challenge. Currently there is very little room for personalized attention to the MOOC course participants. For this reason, the instructional design should provide suitable ways for learners to receive the direction and feedback they need to get the most of their MOOC experience. Some extra information and tips facilitating the learning process by leading the learners to successfully meet the learning objectives set for the specific activity have to be provided too. Nevertheless community managers and mentors will always face the problem of scale and peer interaction, and peer-to-peer assignments are essential for learner success.

Structure vs. Flexible evolvement

MOOCs are available anywhere/anytime in small digestible components and so called flipping content (Brame C. 2013) that allow students to learn easily and under a wide variety of places, times, and situations which is one of their fundamental differences from the conventional educational technology. Proper flipping makes sure everyone is on the same page and no one gets neglected, but no one drops out due to boredom, either. Designing a well-structured MOOC often pays off since it is easier for learners to have good orientation through the topic. However, it is also a bit of a trade-off: Students/learners in the course should be able to come up with their own examples, solutions and approaches that go beyond the structures and solutions of the teacher in order to unleash the full potential of creativity and innovation of all brains in the course.

Instructional design model

Concerning the instructional design models to be employed with MOOCs, MOOCs have been classified by Stephen Downes (Siemens G. 2012) into two distinct types: xMOOCs (Extended MOOCs) and cMOOCs (Connectivist MOOCs). xMOOCs are designed to be run like a classical university lecture or seminar, with a “top-down” model with one (or more) experts designing the learning journey and providing their knowledge to a group of learners. From the other side, the key concept behind cMOOCs is the networking, i.e. the learners may go anywhere to locate sources of information. cMOOCs provide variety of approaches in a dynamic constantly changing learning environment requiring learners to take full control of their own activities and by this reason these courses are characterised as learner-centred (Lackner & Kopp 2014).

A new trend in MOOC development is the use of mixed approaches. These mixed approaches should combine social learning activities through online collaborative tools, connectivism (Siemens G. 2005), and constructivist approaches for implementation of learning-by-doing and discovery learning activities for knowledge construction.

Last but not least, a variety of gamification techniques could be integrated into the course in order for the learners to be motivated and stimulated to strive for better achievements and progress in the course.

5. Example Courses

Course “Design 101”

Period: October 2013 – January 2014

Course Length: 10 weeks

Language: English

Instructors: Stefano Mirti, Giovanni Pasca Raymondi and Lucia Giuliano

Content Provider: Abadir, Italy

Platform: iversity.org

Brief course description: This creative art course ran for three months on iversity.org and participants were asked to solve 101 daily short quiz exercises with input and feedback from the course providers. The final learning unit was created by learners from the course themselves and there was an art exhibition in Berlin following up on the learning and content of the course.

„Design 101” is a journey into contemporary design in which you will transform yourself and your everyday life in 101 projects. For three months, you will develop basic design attitudes that will allow you to thrive in today’s world, while restoring your understanding of its mechanics. We live in a global community where the physical bits are slowly (and not so slowly) overlapped by social media. Design has become #design. Indeed, the use of new technologies has changed teaching and, by the same token, the nature of the past; the past is being renewed. Herein lies the conceptual hinge of Design 101: a new way to learn a new design. To do so, we will collectively explore the tools of today (such as this MOOC platform) to step into a fantastic voyage through time and space, in which we are all absolute beginners“.

The Syllabus covered topics in object design, representation of oneself, food design, design as a garden, interior spaces, shapes, colours, materials, form that follows fiction, real world exhibition etc.

Pedagogic Framework: Every day, students received a special package from a different place along their journey. The package introduced objects, characters and narrative of the course.

Each week, there was a new chapter consisting of seven postcards outlining a few simple activities to trigger your imagination. From 15 minutes to one hour of work per day at the most. On Mondays, they got an overview of the week and a quiz to complete. Then, following their input, they started working. By Sunday, the participants had to upload images and descriptions of what they had created during the week.

The special trip throughout the course ended with an offline art exhibition in Berlin, with contributions from participants from all over the world.

Course “Creativity, Innovation, and Change”

Course Name: Creativity, Innovation, and Change

Period: 2013 and 2014

Course length: 8 weeks



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Timing: 3-5 hours/week

Language: Subtitles available in English

Instructors and supporting team:

- Dr. Kathryn W. Jablokow; Associate Professor; Mechanical Engineering and Engineering Design - Instructor
 - Dr. Darrell Velegol; Distinguished Professor of Chemical Engineering; Department of Chemical Engineering - Instructor
 - Dr. Jack V. Matson; Professor Emeritus; Department of Environmental Engineering – Instructor
- Content Provider: The Pennsylvania State University

Platform: Coursera

Website: <https://www.coursera.org/learn/creativity-innovation/>

Brief course description: Use of intelligent fast failure to build innovative skills. The CENTER principles are applied in order to drive personal change. This course is designed to maximize experience, interactions and collaborations. A rich volume of quality interactions invokes significant learning between peers. Those interactions and peer-to-peer responses are what will make this course special! Connect with others of similar interests and form groups to further your interests. Strongly consider team projects, perhaps with students from different cultures and countries.

The content is structured in accordance with a logical matrix based on the set of instructional building blocks covering the following main topics:

- Introduction of the three thematic foundations of the course, Creative Diversity (CD), the six CENTER practices, and Intelligent Fast Failure (IFF);
- Best practices and practical techniques to make the idea generation process more effective by use of the three pillars – CD, CENTER and IFF;
- Introduction of different approaches to, and criteria and principles for, evaluating and selecting ideas;
- Building a Creative Team and introduction of techniques for:
- Finding useful collaborators after identifying cognitive gaps in the team;
- Make team decisions in selecting a core idea for a project;
- Investigate collaborative tools to facilitate team communication.
- Research and Resistance – focused on design strategies for doing creative 'research' around the new ideas; identification of different sources of resistance and strategies for managing it; branding yourself and your ideas and projects in creative ways.
- Creativity Metrics and Measurements;
- Critical Experimentation – Planning and Prototyping.

Pedagogic Framework: Course strategies and learning objectives could be summarized as follows:

- Lead students through the creative process, from ideation to implementation;
- Focus on experimentation and experiential learning;

- Encourage reflection and personal development;
- Promote collaboration.

The following three levels of the student engagement are supported:

- Tourist – no certificate;
- Explorer – Basic Certificate;
- Adventurer – Certificate with Distinction.

Focus is put on the community and the use of social media and users are free to select their level of engagement, which is closely connected with their active participation in all the planned compulsory and optional synchronous and asynchronous online activities.

From the pedagogical perspective the instructional design is based on provision of a course of medium-level of difficulty, that consists of information which all MOOC course learners should receive and master as well as additional/optional learning content and activities for those who want to obtain more knowledge and expertise. The instructional building blocks cover short videos and automatically graded quizzes. In the course structure are integrated personal and group exercises and projects which trainees have to fulfil. The online projects and case studies contribute the learners to be triggered to enhance their problem-solving and decision-making skills by making selections that promote discovery learning and stimulate their innovative thinking and creativity. The supported discussion forums as well as alternative forms of assessment for social learning, such peer group evaluations are also provided.

6. Conclusions

MOOCs centred around creativity and innovation live and die with social interaction and activities. Given the developments in both instructional design and platform features fostering peer learning and activities, we expect the quality of these types of MOOCs to improve greatly. Many experts from creative fields were more resistant to offer MOOCs than e.g. experts in the field of computer science or natural science, because they were believed MOOCs could only work for “right and wrong” type courses. Given the developments in instructional design and technical features we expect more experts from these fields to join the MOOC wave and start offering courses.

This will lead to a growing variety of education and professional training options available online through MOOCs to students, professionals and life-long learners and provide them with a rich range of opportunities to improve their creative and innovative potential and thus their career prospects, professional development and their life as a whole.

To find the right course for one’s learning style might not always be easy, but given the rise of rating sites for MOOCs (e.g. Class Central) and the option to just try out different free courses, learners will be able to choose the right courses. One recommendation to end: when trying out a “creative” MOOCs it often makes sense to not just look at some videos, but to take a quick dive into the community and the activities, since these are even more important in this field than in other MOOCs.

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Appendix

Examples of MOOCs focused on Innovation and Creativity - Details and Brief Description			
1	Course Name	Creative Problem Solving	This course deals directly with your ability for creativity which is a critical skill in any field. It focuses on divergent thinking, the ability to develop multiple ideas and concepts to solve problems. Through a series of creativity building exercises, short lectures, and readings, learners develop both an understanding of creativity and increase their own ability.
	Institution	University of Minnesota	
	Platform	Coursera	
	Web link	https://www.class-central.com/mooc/1636/coursera-creative-problem-solving	
2	Course Name	Creative Programming for Digital Media & Mobile Apps	This course will teach you how to develop and apply programming skills to creative work. This is an important skill within the development of creative mobile applications, digital music and video games. It will teach technical skills needed to write software that make use of images, audio and graphics, and will concentrate on the application of these skills to creative projects. Additional resources will be provided for students with no programming background.
	Institution	University of London International Programmes	
	Platform	Coursera	
	Web link	https://www.class-central.com/mooc/529/coursera-creative-programming-for-digital-media-mobile-apps	



3	Course Name	Ignite Your Everyday Creativity	This course will teach you how to develop and apply programming skills to creative work. This is an important skill within the development of creative mobile applications, digital music and video games. It will teach technical skills needed to write software that make use of images, audio and graphics, and will concentrate on the application of these skills to creative projects. Additional resources will be provided for students with no programming background.
	Institution	State University of New York	
	Platform	Coursera	
	Web link	https://www.class-central.com/mooc/3139/coursera-ignite-your-everyday-creativity	
4	Course Name	Innovation: the Key to Business Success	This short free online course, which benefits from CPD accreditation, is designed for anyone interested in commercial innovation. In this course you will learn: - how to encourage and contribute to innovation in your business; - how to turn ideas into reality (for the benefit of the business); - the role of people in successful innovation.
	Institution	University of Leeds	
	Platform	FutureLearn	
	Web link	https://www.class-central.com/mooc/2061/futurelearn-innovation-the-key-to-business-success	
5	Course Name	Gamification	Gamification is the application of game elements and digital game design techniques to non-game problems, such as business and social impact challenges. This course will teach you the mechanisms of gamification, why it has such tremendous potential, and how to use it effectively. For additional information on the concepts described in the course, you can purchase Professor
	Institution	University of Virginia	
	Platform	Coursera	



	Web link	https://www.class-central.com/mooc/343/course-gamification	Werbach's book For the Win: How Game Thinking Can Revolutionize Your Business in print or ebook format in several languages.
6	Course Name	Design Thinking for Business Innovation	Design Thinking is a popular new idea in the business world – organizations as diverse as entrepreneurial start-ups, big established corporations, and government and social service organizations are experimenting with Design Thinking as an alternative approach to traditional problem-solving.
	Institution	University of Virginia	
	Platform	Coursera	
	Web link	https://www.class-central.com/mooc/649/course-design-thinking-for-business-innovation	
7	Course Name	Innovation: the World's Greatest	This course considers innovations throughout history identifying that very few innovative ideas are new; the vast majority take something that is already working and improve it, be it a product, service or process. You'll consider the development of an innovation that you are particularly interested in, and, through a short project, produce and share with other learners your interpretation of its history.
	Institution	University of Leeds	
	Platform	FutureLearn	
	Web link	https://www.futurelearn.com/courses/the-worlds-greatest-innovations	
8	Course Name	Start Writing Fiction	Start Writing Fiction focuses on a skill which is central to the writing of all stories and novels – creating characters. You'll learn how to develop your ideas and the importance of reflecting on



	Institution	Open University	writing and editing, and you'll hear other writers talking about their approaches to research and consider ways of turning events into a plot. You'll also have the opportunity to review and comment on the work of fellow writers, and receive peer feedback on your own story, learning the importance of reading as a writer and how to receive and respond to feedback.
	Platform	FutureLearn	
	Web link	https://www.futurelearn.com/courses/start-writing-fiction	
9	Course Name	Idea Generation Methods	In this course, certain methods for Idea Generation will be explained to enable you to develop and drive your own ideas. Besides learning these methods you will have the opportunity to develop and present a self-chosen idea. The MOOC 'Idea Generation Methods' aims to explain techniques for the goal and process oriented generation of ideas. Idea generation is part of the fuzzy front end of the innovation process. Participants have the possibility to work on specific innovation topics in the area of sustainable energy. Dr. Daniel J. Koch will impart a broadly diversified knowledge of the methods used in idea generation and he will show you how you can use them by your own.
	Institution	Karlsruhe Institute of Technologies	
	Platform	iversity	
	Web link	https://iversity.org/en/courses/idea-generation-methods	
10	Course Name	Social Innovation	Social innovations, i.e. new social practices, are everywhere and largely influence our lives: they change the rules of the game in business, civil society and politics. With social innovations, we can design social practices that are more beneficial, sustainable or just. But what are social innovations? And what effects can they have? This course is an introduction to the topic. You will gain an overview of what social innovations are, how they function and how they can be developed.
	Institution	EBS	
	Platform	iversity	
	Web link	https://iversity.org/de/courses/social-innovation-101-en	



11	Course Name	Changemaker - Social Entrepreneurship	German - Be the change you want to see! In Changemaker MOOC you learn how to develop a project from an idea in order to solve a social problem. We'll show you how you can use entrepreneurial approaches to solve social challenges, no matter if you want to realize a project in the areas of society, environment, education or culture. The course takes you step by step to create your own project design.
	Institution	CAU	
	Platform	iversity	
	Web link	https://iversity.org/de/courses/changemaker-mooc-social-entrepreneurship	
12	Course Name	Creativity and Entrepreneurship	The course approaches entrepreneurship as a creative process, a fundamental human instinct that we all possess and can unlock. Creativity & Entrepreneurship applies concepts from the creative and musical creation process, such as observing, prototyping, iterating and embracing failure, as a means of guiding you through the concept of thinking like a start-up. You will develop the basic mindset, knowledge, and insights required to pursue an entrepreneurial career, whether as the steward of your own career or as the founder of a new business in any field.
	Institution	Berklee	
	Platform	edX	
	Web link	https://www.edx.org/course/creativity-entrepreneurship-berkleex-oentr-391x-0	
13	Course Name	Reinvent Yourself: Unleash Your Creativity	Dr. Roberta Ness, featured TED speaker, author, and one of America's leading creative thinking innovators, will guide you through her exclusive 5-step program to being an effective innovator. Learn to break free from your usual thinking pattern and start generating creative solutions to life's challenges. Sharpen your powers of observation, make surprising associations, expand your idea
	Institution	University of Texas	
	Platform	edX	



	Web link	https://www.edx.org/course/reinvent-yourself-unleash-creativity-uthealthsphx-imagine99x	space, and even master how to think backwards. Hone your creative thinking skills by solving real-world problems from business and science.
14	Course Name	Innovation Generation: How to Be Creative	This course is based on an extraordinarily successful program that has been presented at over 70 top American universities. Over the next 5 weeks Dr. Roberta Ness, an internationally renowned physician-scientist and an expert in innovative thinking, provides proven techniques to expand your originality. The method she will teach you is described by the acronym PIG In MuD: Define the problem, identify frames, generate all possible alternatives, incubate, meld to your best ideas, and disseminate.
	Institution	University of Texas	
	Platform	edX	
	Web link	https://www.edx.org/course/innovation-generation-how-be-creative-uthealthsphx-inov101x	
15	Course Name	Creativity, Innovation, and Change	Use of Intelligent Fast Failure to build innovative skills. Application of CENTER principles to drive personal change. Implementation of value creation skills to initiate lasting change. This course is designed to maximize experience, interactions and collaborations. A rich volume of quality interactions invokes significant learning between peers. Those interactions and peer-to-peer responses are what will make this course special! Connect with others of similar interests and form groups to further your interests. Strongly consider team projects, perhaps with students from different cultures and countries.
	Institution	The Pennsylvania State University	
	Platform	Coursera	
	Web link	https://www.coursera.org/learn/creativity-innovation	



16	Course Name	Developing Innovative Ideas for New Companies: The First Step in Entrepreneurship	Part of a 4-course series. This course assists aspiring and active entrepreneurs in developing great ideas into great companies. With strong economies presenting rich opportunities for new venture creation, and challenging economic times presenting the necessity for many to make their own job, the need to develop the skills to develop and act on innovative business opportunities is increasingly vital.
	Institution	University of Maryland, College Park	
	Platform	Coursera	
	Web link	https://www.coursera.org/learn/innovative-ideas	
17	Course Name	Identify, Analyze, and Launch Your Startup / Specialization	The Entrepreneurship Specialization examines the entrepreneurial mindset and skill sets, indicators of innovation opportunities, critical steps to bring innovations to the marketplace, and innovation strategies to establish and maintain a competitive advantage. Fundamentals of new venture financing are explored with attention to capital structures for new ventures, term sheets and how to negotiate them, and the differences between early-stage versus later-stage financing. You will develop an understanding of how to develop winning investor pitches, who and when to pitch, how to avoid common mistakes, and how to 'get to the close'. In the final Capstone Project, you will apply the tools and concepts from the specialization courses by crafting a comprehensive, customer-validated business model, and creating a business plan and investor pitch.
	Institution	University of Maryland, College Park	
	Platform	Coursera	
	Web link	https://www.coursera.org/specializations/business-entrepreneurship	
18	Course Name	Starting a Business 1: Vision and Opportunity	This course is the first in a series of six about 'starting a business'. You can sign up to the other courses in this series through the Going to University collection. A successful business starts with a clear vision and a thorough understanding of the opportunities available to turn that vision into a reality. Whether you have an idea for a venture in the future or you already have a sideline business whilst studying, this course will help you consider your vision and explore the opportunities
	Institution	University of Leeds	
	Platform	Future Learn	



	Web link	https://www.futurelearn.com/courses/starting-a-business-1	available. It will give you the time to plan, share your ideas with others and start to document your thoughts in a structured business plan.
19	Course Name	Planning Change and Innovation	This course offers a step-by-step approach to managing ideas in any organization – for-profit or non-profit – private or public. Twelve classes that include examples and case studies will help trainees to learn and practice skills such as benchmarking, goal setting, performance measurement, solving problems, generating ideas, managing projects, leading teams, evaluating team members, and communicating more effectively.
	Institution	National University of Ireland Galway	
	Platform	Coursesites	
	Web link	http://www.openeducationeuropa.eu/en/mooc/planning-change-and-innovation	
20	Course Name	Creative Problem Solving and Decision Making	This course is tailored for everyone who is involved or interested in creating or managing successful innovation - you could be a student, a designer, a manager or an entrepreneur.
	Institution	Delft University of Technology	
	Platform	edX	
	Web link	https://www.edx.org/course/creative-problem-solving-decision-making-delftx-tpm1x#!	
21	Course Name	Design Thinking (2nd edition)	This course is tailored for everyone who is involved or interested in creating or managing successful innovation - you could be a student, a designer, a manager or an entrepreneur.



	Institution	Macromedia University for Media and Communication	
	Platform	iversity	
	Web link	http://www.openeducationeuropa.eu/en/mooc/design-thinking-2nd-edition	
22	Course Name	Innovation and Enterprise	This course examines a model for an innovation process. Introducing something new or innovating is easy in theory but hard in practice. New ideas can be plentiful, but selecting the best ideas and implementing them can be challenging. Managing the innovation process is neither a scientific process nor a black art. In addition to detailed research and planning, its success is influenced by human factors and, of course, luck!
	Institution	Loughborough University	
	Platform	Future Learn	
	Web link	http://www.openeducationeuropa.eu/en/mooc/innovation-and-enterprise	