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# Teaching entrepreneurship using Massive Open Online Course (MOOC)

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## ABSTRACT

Entrepreneurship as a skill and process is increasingly being taught as a part of various university educational programmes. The literature is divided on the effectiveness of traditional methods to teach entrepreneurship. We consider the achievement of students learning outcomes in entrepreneurship course that is offered as a Massive Open Online Course (MOOC). The results suggest that the MOOC is a suitable platform to teach entrepreneurship as it provide tools to enable students' collaborative learning as well as improve individuals' affective key entrepreneurial aspects such as such opportunity recognition and resource acquisition.

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## 1. Introduction

Entrepreneurship, as a skill and activity, is often associated with innovation, technological progress, economic growth and the generation of employment. This view is particularly held by policy makers (Minniti and Lévesqu, 2008) and hence there has been a general support and encouragement from the governments towards offering entrepreneurship courses within different academic programmes (Martin et al., 2013). While there is a body of research that questions the link between teaching entrepreneurship and economic growth in developed countries (Oosterbeek et al., 2010), there seems to be an agreement that teaching entrepreneurship has a number of positive effects and benefits (Sheshinski et al., 2007). These benefits include the inculcation of thinking, collaborative and communication skills that are highly valued by employers. A growing number of undergraduate programmes are opting to include courses related to entrepreneurship.

Rasmussen and Sørheim (2006) reported on action based entrepreneurship education in five different universities.

Entrepreneurship can be described as a positive frame of mind that is aimed at the identification and realisation of value. Besides the typical entrepreneurial skills such as collaborative, management and financial skills, an ideal entrepreneurship course should foster positive thinking. This paper reports on the use of a Massive Open Online Course (MOOC) to teach entrepreneurship to engineering students at Taylor's University (Malaysia). The MOOC is selected because it can provide the on-campus engineering students the opportunity to work with students from all over the world. It also provides a platform to deploy innovative techniques aimed at inculcating and enhancing positive thinking.

## 2. Massive Open Online Courses

Distance learning, where students take courses while being physically separated from their teachers for majority of the duration of the course (Barker and Holley, 1996) is by no means a new phenomenon. It has been delivered through mail, radio and

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TV and recently through the Internet. Distance learning provides limited interaction between students and lectures and rarely any collaboration among the students themselves. Distance learning is often viewed as a second option or an alternative type of education and it did not really grow to the level that it becomes a major segment of education provision. However, this may be quickly changing now thanks to the MOOCs, which are offered openly online, for free, to students anywhere in the world (Kop et al., 2011). Although the first MOOC was offered by the University of Manitoba in 2008 (Fini, 2009), MOOCs seem to be picking up now as two trends are converging, namely the inability of physical campuses to cater for the higher education needs of the growing world population and the maturity of the technology that makes broadband internet more accessible and reliable. In 2011, a Massive Open Online Course (MOOC) about Artificial Intelligence offered by Stanford University attracted 160,000 students from around the world, with 23,000 of them managing to successfully complete the course, - a completion rate of 14%.

Since their inception, MOOCs attracted a wide variety of responses ranging from describing them as a passing fad to being a force that will change the world educational landscape. Early MOOCs have focused on engineering and computer science knowledge and skills, but researchers and instructors wonder whether MOOCs can have a place in teaching skills such as critical thinking, problem solving, communication, and entrepreneurship (National Research Council, 2012).

### 3. Entrepreneurship MOOC

Taylor's University's purpose is "to educate the youth of the world to take their productive places as leaders in the global community." In order to produce well-rounded engineers that are ready to address Grand Challenges and contribute positively to the industry and society at large, the curriculum is designed not only with engineering technical courses, but other courses – Project Management, Innovation, Globalisation and Entrepreneurship. Normally around 60–80 students with an aim of developing business skills to complement the technological knowledge and skills. It is offered over a 14-period and includes a series of lectures as well as a group project to develop a business idea using acquired entrepreneurial skills. The course features a variety of tutorials and project pit stops where the students are given feedback and guidance on their projects' progress. Assessment is 50% course work and 50% final exam. Upon completion students are expected to be able to:

1. Describe the key factors in organising.
2. Explain the importance of meeting customer needs.
3. Explain the importance of effective resources management.
4. Exemplify the widening job description of a professional engineer.
5. Explain the importance of human resource management.
6. Appraise the prospects of E-commerce projects.

The course outline considers:

1. Why Entrepreneurship?
2. Think like an Entrepreneur.
3. Build an Entrepreneur dream team.
4. Execute like an Entrepreneur.
5. Focus like an Entrepreneur.
6. Create Value like an Entrepreneur.
7. Mange projects like an Entrepreneur.
8. Learn like an Entrepreneur.
9. Inspire like an Entrepreneur.

10. Communicate like an Entrepreneur.
11. Sell like an Entrepreneur.
12. Manage risk like an Entrepreneur.
13. Be a global Entrepreneur.

### 4. Brain rewiring

The human brain seems hard-wired to respond to negative stimuli (Ito et al., 1998). While important to ensure survival in the dangerous environment that our ancestors used to inhabit, this asset is a liability for teaching entrepreneurship as positive thinking and the ability to respond to opportunities are paramount. Baron (2008) suggests that individuals' affect influences key aspects of entrepreneurship practice. To *rewire* the brain to respond to positive stimuli can be achieved by keeping a gratitude journal reporting things that an individual is grateful for on a daily basis (Ben-Shahar, 2010). This exercise is utilised in this MOOC as a whole section is dedicated for brain rewiring whereby students publically report on the three things that they are grateful for on a daily basis. Repeating this daily exercise for the period of the course is aimed at creating positive thinking attributes.

### 5. MOOC delivery

The platform used to deliver the MOOC is OpenLearning.com. OpenLearning provides many social media like features such as forums to enable students to comment and receive comments encouraging interaction while learning. OpenLearning has other interesting features such as karma points, that are gained through positive comments from peers, and badges that can be issued either automatically or when a certain learning goal is achieved. These features, together with a live progress bar, encourage learning and collaboration throughout the course.

Including the 60 on-campus students, this MOOC attracted 1600 online student from 115 countries. Online students were required to watch all the recorded lectures and complete all the assignments and other core activities of the course. A key course component is the group project that online student were also required to complete. The on campus students were required to 'recruit' online students to their teams. Keeping up with different course milestones is very important. Once the team's project is on track, it is noticed that the online students were generally motivated to complete the course as their commitment is not only important for their success but also to the success of their team members. The course is available at:

<https://www.openlearning.com/courses/Entrepreneurship>

### 6. Evaluation of the MOOC

To evaluate the effectiveness of using the MOOC to teach entrepreneurship, a number of important constructs are assessed. These include students' motivation (reasons to join the course), peer collaboration, achievement of learning outcomes and the use of resources made available to students especially brain rewiring. On campus students' results in the exam were analysed through a longitudinal study comparing the results for two consecutive semesters. Information was collected through the administration of a questionnaire that has both multiple choice questions and open-ended questions to solicit students' feedback.

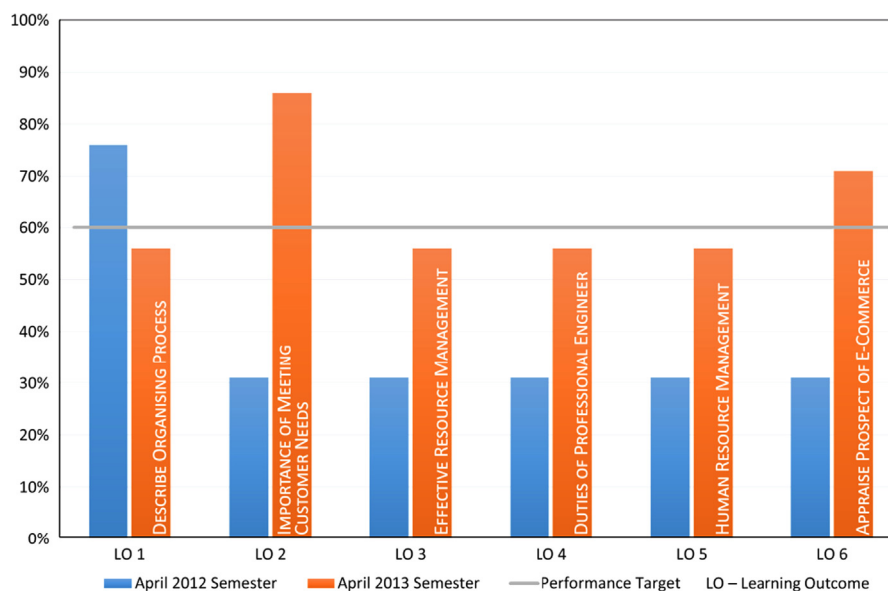


Fig. 1. Achievement of the course learning outcomes.

## 7. Results and discussion

A total of 80 students responded to the questionnaire. Majority of the respondents indicated that they registered for the MOOC either because they are planning to start their own business, or personal interest, or for career advancement purposes. More than 80% of the respondents found the learning in the MOOC to be effective and indicated that they received feedback related to their work. Respondents indicate a high level of peer support. This is indicative of considerable level of students' collaboration.

In general, a very high level of satisfaction with the quality of the learning materials provided. This was corroborated by the students' qualitative feedback. Brain Rewiring exercises also received very good responses and were perceived as inspiring, useful and fun.

In the qualitative feedback students indicated: overwhelming gratitude, happiness and satisfaction with the (1) lecturer, (2) lecture quality and production as well as (3) *brain rewiring* activities. Responding to a question related to how to improve the MOOC, few suggestions were received mainly related to introducing live chat with online students and adding a subtitle to the videos of the lectures. The students found a number of aspects of the MOOC to be highly enjoyable, the top three where the lecturer, Brain Rewiring, and collaboration and meeting new people.

This evaluation also looks at the students overall performance in the course and the achievement of learning outcomes to augment the findings of the survey. In its effort to quantitatively measure and document the Outcome Based Education (OBE), the school of engineering at Taylor's University developed a software tool to measure the achievement of each learning outcome through measuring students achievements on different assessment components (that are mapped to different learning outcomes). Course learning outcomes are mapped, in turn, to the programme outcomes, giving a complete picture of how each student and the entire cohort is faring in terms of achieving the programme outcomes (Namasivayam et al., 2013). A course Learning Outcome (LO) is deemed to be achieved if a minimum of 60% of the students achieved an average of 60% or more in the assessment components related to that LO. The 60% benchmark is selected by the school after a benchmarking exercise performed in comparison to other similar engineering programmes in Malaysia. As the Continual Quality Improvement (CQI) move on, the

benchmark can be reviewed and increased. Fig. 1 shows the achievement of the learning outcomes for the April 2013 Semester and compares it to the April 2012 semester. Clearly, apart from the first learning outcome, there was improvement on all the learning outcomes for the April 2013 semester when compared to the previous semester results. It is also worthy of noticing that the previous offering of this course did not result in achieving the performance targets of the learning outcomes two through five.

A total of 25% of the online students managed to complete the course – a good result for a MOOC. The passing rate for on-campus students was 90%.

## 8. Conclusions

"Entrepreneurship", offered by Taylor's University (Malaysia), is the first MOOC offered by a Malaysian institution of higher learning. While providing hands on practicable techniques, the MOOC presents entrepreneurship as a thinking framework requiring a the brain to be *rewired* to resist over response to negative stimuli. It features lectures, tutorials, online quizzes and a project that requires the students to work in teams on a business task. On-campus students are required to recruit online students into their teams. A unique feature of the course is the *brain rewiring* daily exercise, which requires daily discussion board postings of student self-reflections with an entrepreneurial mindset. A total of 1600 students from 115 countries are active in this MOOC with 60 on-campus students. The platform used for this MOOC is Open-Learning.com. High completion rate and achievement of learning outcomes were. The MOOC is a suitable platform to teach entrepreneurship and other similar courses evident in an applied science and engineering setting.

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