

# Deployment of MOOCs in Virtual Joint Academic Degree Programs

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**Abstract:** This research paper investigates the readiness of students to opt for MOOC courses in universities offering a joint master degree international programme. A study is conducted on two joint academic study programs offered by the University of Hasselt in Belgium and Princess Sumaya University for Technology in Jordan. The study examines the readiness of students to take MOOC courses and their acceptance by universities' management staff and professors. The study reveals promising results as the results suggest that such virtual study programs are readily accepted in both universities by professors and students. On the other hand, management staff and some professors expressed concerns on the approval of the equivalence of a MOOC onto courses.


## 1 INTRODUCTION

International collaboration between universities has become a necessity in order to gain access to universal knowledge. Partnerships are key to staying competitive with an up-to-date academic calendar and be capable of satisfying larger numbers of students and innovating quickly by developing unique technologies on global scale. Specific importance is given to join postgraduate degree programs in order to enhance the international visibility of higher education institutions, particularly those taught in English (McCallum, 2010). However, students' mobility is a major obstacle in this type of collaboration due to financial, social, political and visa problems. In fact, many students find it difficult to leave their jobs and families to join an international university for long periods.

Since 2008, University of Hasselt (UHasselt) of Belgium and Princess Sumaya University for Technology (PSUT) of Jordan, have maintained cooperation in a MSc Management with two specialisations, namely management information systems (MIS) and international marketing (IM). According to the agreement, students take one semester (four courses) at PSUT and then move to

UHasselt for one academic year where they take extra courses and complete a master thesis. Furthermore, there is also a separate agreement for the exchange of bachelor and master students and participation of UHasselt students in a summer school at PSUT.

Massive open online course (MOOC) have been found a suitable option for delivering learning content online to students who opt to take a course instead of physically move to the host university. Over the past few years, several universities facilitated partnership with MOOCs providers and are building MOOC courses to serve as an e-learning versions of their courses. In fact, providers on the internet are currently making MOOCs available for learners who can study the learning content on a self-paced manner and who can complete readings and assessments and receive help from a large community of learners through discussion forums (Jasnani, 2013; Reilly, 2013). Furthermore, MOOC providers attract students with short, high quality instructional videos that communicate learning content directly without exceeding today's student attention span thresholds (Ong and Grigoryan, 2015). For example, in a typical 8- to 12-minute video, students would be provoked to take two to three interactive quizzes to make sure they understand the material before continuing with the

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lesson (Pappano, 2012). In addition, students can interact, share, and critique ideas via blogs or discussion board forums at a MOOC platform. They can also meet fellow classmates from different regions and work on joint projects, or support groups.

Although MOOCs have some common characteristics with ordinary courses such as a predefined schedule of sessions, assignments, and assessments. However, access to MOOCs can be free with no prerequisites other than internet access. Furthermore, upon completion of the course, students can have certification of completion which is different from legal accreditation (Kope and Fournier, 2013). Krause and Lowe (2014) discuss a useful composition of the claims made about the promises and threats of MOOCs. They show that MOOCs have the potential to challenge the closed nature of academic knowledge in traditional universities. The feature of openness of MOOCs is an essential outcome of the Internet rather than a result. Furthermore, there is high dropout rates for MOOC courses and only few MOOC courses are available by universities, which provides the pathways and supports to recognise the academic qualifications. On the other hand, the growth of the MOOC has potential to address the problem of meeting increasing demand for higher education.

Based on the above discussion, it has become evident that MOOCs have become prominent in education. In this paper, the case of collaboration between UHasselt and PSUT in a master degree programme is presented. The readiness of both universities, staff and students to opt for MOOCs as an optional mode of course delivery is discussed.

## 2 INTERNATIONAL COLLABORATION IN JOINT-DEGREE PROGRAMS

The collaboration between universities in the international education field is mutually beneficial: it gives the universities involved benefits and makes a “win-win” situation possible by achieving more than one could do in this field alone. It draws on the experience and expertise available in different fields and places and thus creates a better educational offer on the international level that is also more competitive. It thus achieves for the partners worthwhile results that are more effective, better and larger than when a university would do this on its own alone. Success of the collaboration between universities in the international education

automatically leads to an increased orientation towards this collaboration program. One of the important factors of success this program is indeed the gaining of satisfaction of the students and their families and the staff of both universities.

Since 2008, University of Hasselt (UHasselt) and Princess Sumaya University for Technology (PSUT) have maintained cooperation in an MSc Management with two specialisations, namely Management Information Systems (MIS) and International Marketing (IMS). According to the agreement, students take one semester (four courses) in PSUT and then move to UHasselt for one academic year where they take extra courses and complete a master thesis. Furthermore, there is also a separate agreement for the exchange of bachelor and master students and participation of UHasselt students in a summer school at PSUT.

Figure 1 shows the number of Jordanian students already studies at UHasselt. In addition, in the academic years 2008 and 2009 UHasselt offered two Ph.D. scholarships to PSUT. Two candidates already earned their PhDs from UHasselt and now working as professors at PSUT.

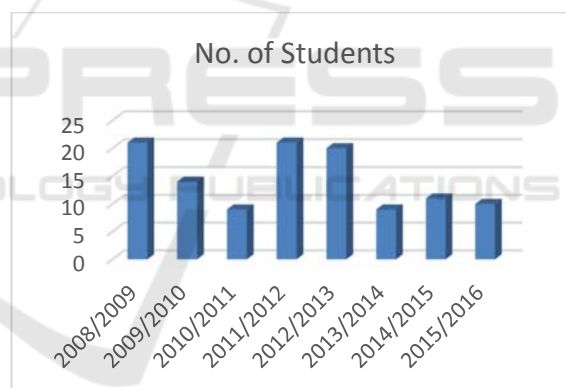


Figure 1: Number of Jordanian students enrolled in virtual study programs at UHasselt.

PSUT utilizes an e-learning platform containing all e-material, in the context of developing its solution to develop e-learning and facilitate its implementation. PSUT signed a Memorandum of Understanding (MoU) with Doseyeh for e-learning portals. The company provides contemporary technologies in the e-learning through a social academic network. Through these services, students and professors can exploit the opportunity for e-learning and exchange of information and courses materials. These services will mitigate the load of carrying heavy books and hard copies and save the expenses of buying them. Through these services, students will access and benefit from a number of

academic books and research services as well as be able to upload their research online, obtain high quality educational material and gain access to recent publications. Through this agreement, PSUT can make these services available to its international partner's network to develop the e-learning platform and databases.

UHasselt uses Blackboard, e-learning platform to improve students' skills, update their materials and make a constantly contact with their teachers.

### 3 MOOCs AND OPEN EDUCATIONAL RESOURCES

The term "Massive" in MOOCs stands for enrolling thousands of students. The courses are "Open" because anyone with an internet connection can enrol and should not possess any prerequisites such as a qualification or a level of performance in earlier studies. The access is free except if a learner opts for a certificate or an academic credit. MOOCs are inherently online and are considered as "courses" because they are scheduled in a timeframe, have assignments, tests and exams to assess the knowledge gained by students. After finishing the learning process, students can obtain a certificate, being sometimes accepted as a college credit.

Despite the success of MOOCs in enrolling massive numbers of students, only a very limited number of registered learners are completing the course, and the majority stops learning already at an early stage. As an example, the University of Edinburgh recorded that only 12% of the enrolled students completed the course (Rosewell and Jansen, 2014). The average MOOC course is found to enrol around 43,000 students, 6.5% of whom complete the course. Enrolment numbers are decreasing over time and are positively correlated with course length. Completion rates are consistent across time, university rank and total enrolment, but negatively correlated with course length.

Low completion rates might indicate that the open nature of MOOCs allows students to enrol on courses for which they are ill prepared. However, many MOOC participants appear well qualified if not over-qualified. For example, in San Jose State University, a pilot project to deliver for-credit MOOCs using Udacity, was carried out with a target audience of students who are presently under-served and left out of higher education and the courses were pitched at college entry level. However, 53% of the student

body had post-secondary qualifications, including 20% with Masters or PhD (Ferenstein, 2013).

Apparently, there are several reasons for the low completion rate. First, students are not able to find the best information they need to choose the right course at the right level. Consequently, they fail to match their level of knowledge. In addition, students miss the relevant content required in their learning process. Second, students are not motivated for individual self-paced learning due to tiresome and ineffective learning model and characteristics of an individual study environment. Third, students lack the practical sense to pass exams because universities and employers do not accept certificates of MOOC courses. Therefore, students are not motivated to take exams.

Therefore, to address the abovementioned MOOCs issues, a research experiment was conducted by adopting MOOCs in a joint master degree program offered by University of Hasselt and Princess Sumaya University for Technology (PSUT). The courses chosen were those which are pre-requisites taken at PSUT as students will have to take post-requisites at UHasselt. Furthermore, students report the adoption of MOOCs, faculty and management at both universities provided feedback by means of survey. The results were analysed in regards to the degree of personalization and knowledge sharing.

#### 3.1 Acceptance of MOOCs by Universities and Students

Current statistics reveal that the completion rate of MOOCs is very low. Only about 15% of the enrolled students become certified while the vast majority stop learning at an early stage (Jordan, 2015; Zhenghao et al., 2015). According to a study conducted by Chuang and Ho (2016), in the first four years of the edX MOOC platform there were 4.5 million participants and 245 thousand obtained a certificate. This implies that only 5.5% obtained credentials for taking the online course. Furthermore, one report shows that completion rates are generally between 2 and 13 percent of enrolled students (Perna et al., 2014); other reports suggest an average completion rate of 10% (The Economist 2014). According to Perna et al. (2014), a review of 16 MOOCs used in the Coursera platform by the University of Pennsylvania, reported that the completion rate (participants receiving a final grade of at least 80%) was 4%. On the other hand, DeBoer et al. (2014) argue that it is inappropriate to calculate MOOCs completion rate based on registration. Koller et al. (2013) suggested that taking

in consideration student intent is vital in assessing course completion rate.

On the other hand, survey was conducted at the start of the University of Derby's Dementia MOOC, where 775 learners were asked whether they expected to fully engage with the course. More than 61% of learners said yes, but 33% of learners stated that they did "NOT INTEND TO COMPLETE" the course (Clark, 2016). This showed that people come to MOOCs with different intentions. The survey also showed that around 35% of both groups completed the course, which is a much higher level of completion than the vast majority of MOOCs.

It seems that the problem of completion rate may be identified due to two main reasons, first the inability of students to match their level of knowledge and complexity of choosing the right course at the right level and covering the relevant content. Second the lack of practical sense to pass exams because universities and employers do not accept certificates of MOOC courses.

A consortium of Big Ten universities, prepared a briefing in late 2012 (Voss, 2013) about the MOOC phenomenon for their provosts and presidents, posing the question: Is this time different? That question was based on the premise that, over the past decade, online education has moved ahead relatively slowly with fits and starts such that the disruption that is changing higher education institutions and pedagogy has been more evolutionary than revolutionary. The consortium concluded that, indeed, the answer to the question is a definite YES! To quote their view: "The effect on residential universities relative to previous experiences and events in the arena will be profound and long-term."

Accordingly, only time will tell if such predictions are correct. Right now, for nearly all involved, MOOCs are still an experiment. The institutions involved thus far are prestigious, the faculty renowned and motivated, and the topics largely handpicked by the institutions, MOOC entities, or both in concert. The participating colleges and universities have stated that they believe their involvement with these initial efforts will extend, enhance, and preserve their institutional reach, brand, and reputation.

### 3.2 Research Methodology

In order to investigate the readiness of students to take MOOC courses and their acceptance by universities, UHasselt and PSUT are organizing a student exchange program. In a bilateral agreement, a set of courses have been identified as equivalent courses

that can be exchanged between their corresponding curricula. UHasselt is also organizing an international master of Management Information Systems degree program. A group of PSUT students participate in this program annually to earn a master degree in MIS. Nevertheless, some students may not participate in an exchange program or international master's degree program because they cannot stay abroad for a year or a semester. Therefore, to overcome this concern a solution to take virtual courses or to take part in a virtual study program was proposed. Two types of virtual study programs are set forward: a "virtual international study program" and a "virtual exchange study program". In a virtual international study program, a student is registered as an international student in an international study program and can replace some of the courses by MOOCs that are taken in other universities. In a virtual exchange study program, a student can add some MOOCs to his/her selection of exchange courses of the exchange program of his university.

To measure the feasibility and acceptance of both educational models, success indicators were identified. The success indicators are related to the readiness of students to take MOOC courses and the acceptance of MOOC courses by the universities. Success indicators include, Quality of the online learning process, required content coverage, courses and topics selection, readiness for e-learning, evaluation and assessment schemes, and international cooperation and image. A survey was organized using questionnaires sent to management, professors, and students of both universities. Furthermore, the following research questions are set forward.

- What are the advantages and disadvantages of learning MOOC courses?
- Are MOOC courses known, popular and already taken by international students?
- Are management and professors of University of Hasselt prepared to organise a virtual international study program, welcoming MOOC courses as part of the curriculum and accept MOOC credits?
- Are management and professors of PSUT and of University of Hasselt willing to extend their student exchange program to a virtual student exchange program, accepting MOOCs courses as part of the set of exchange courses, accepted in the frame of the Erasmus program or by bilateral agreements?



#### 4 VIRTUAL STUDY PROGRAMS BASED ON MOOCs AT UNIVERSITIES

Currently, some research has systematically examined student perceived advantages or limitations associated with MOOC formats. However, students post in the actual MOOC course shell is analysed, which focuses on learning-centred aspect of students towards MOOC (Liyanagunawardena et al., 2013). Nevertheless, such an approach only provides insight into actively engaged MOOC students and fails to account for students who engage the course content but do not interact. Bremer (2012) suggest that, MOOCs appeal most to very organized and self-motivated students. As a result, the readiness of students towards MOOCs can be measured by the following success factors:

- Availability of a good e-learning system.
- Readiness for taking e-learning courses.
- New kind of online evaluation and assessment schemas.
- Changed living situation and changed cost structure

Two surveys were prepared to study the readiness of students to take MOOC courses and the acceptance of MOOC courses by the universities in the context of two virtual study programs. The first is the virtual international study program where students are registered to pursue a master degree in MIS. In this study program, students can replace some of the courses by MOOCs at PSUT that are equivalent to courses at the University of Hasselt. The second is the virtual exchange study program, where students add some MOOCs to their selection of exchange courses of the exchange program of their university.

The survey related to the virtual exchange study program is designed and directed towards management personnel, professors and students at both universities. The management personnel questions include the legality of conducting such study program, international image value added, international cooperation, and quality of courses. The questions related to the faculty were categorized to the free selection from a global list (in context of partnership agreement), covering required content, quality of the online learning process (quality influences the decision of equivalence). Finally, the questions posed to students are related to the e-learning system, the readiness for e-learning, evaluation and assessment schemes and living and cost conditions. The number of respondents to this

survey is 107 distributed as shown in Table 1. On the other hand, the survey of the virtual international study program is targeted to management personnel and professors at UHasselt and to students from PSUT pursuing an exchange experience at UHasselt. The questions targeted to management personnel and professors are related to the inclusion of virtual students, online courses at UHasselt, possibility that courses replaced by MOOCs, and student cannot select a course by himself. Moreover, questions targeted to students are associated to the e-learning system, the readiness for e-learning, evaluation and assessment schemes and the thesis work were surveyed. The number of respondents to this survey is 55 distributed as shown in Table 1. The surveys' results reveal a high degree of acceptance and readiness to the virtual exchange study program from management personnel, professors and students' perspectives in both universities. However, despite the fact that 84.2% of professors at both universities agree that the required topics are covered by the MOOCs, one can notice that professors at both universities (63.2%) are in favour of setting a pre-specified course list for students. The results related to the virtual international study program also reveal that management, professors and students responded in favour of the adaptation of MOOC courses. Nevertheless, the thesis work conducted by students needs some extra effort and organization as 45.7% obviously have some concerns related to this topic.

The results of the surveys related to both programs show a high degree of acceptance and readiness to implement MOOCs in the context of international and exchange study programs. However, professors and students in both study programs raise some concerns and issues related to courses selection and content. Furthermore, management staff and professors raised concerns related to the approval of the equivalence, in terms of number of credit hours and content, of a MOOC onto courses. UH adapts the ECTS (European Credit Transfer System) while PSUT uses the credit system. Therefore, management staff and professors expressed concerns about the amount of time students spend to complete the required course work and the amount of knowledge gained. To overcome such concerns, we proposed the flipped classroom methodology to be applied in the joint study programs. The flipped classroom approach is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Thus, students can first learn the basic concepts of a specific course at home, using a range of pedagogical content such as, videos, presentations, basic exercises, case studies ...etc. (Lage et al., 2000).

Table 1: Results of the study of the readiness of students to take MOOC courses and the acceptance of MOOC courses by UHasselt and PSUT.

Virtual Exchange Study Program		
	Criteria	Response %
<b>Management: UH + PSUT</b> (5 respondents)	Legally possible:	<i>Yes: 20% Yes But: 80% No: 0%</i>
	International image:	<i>Yes: 60% Yes But: 40% No: 0%</i>
	International cooperation:	<i>Yes: 20% Yes But: 80% No: 0%</i>
	Free selection from a global list:	<i>Yes: 20% Yes But: 60% No: 20%</i>
	Quality of course:	<i>Yes: 100% Yes But: 0% No: 0%</i>
<b>Professors: UH + PSUT</b> (19 respondents)	<b>Criteria</b>	<b>Response %</b>
	Free selection from a global list (in context of partnership agreement):	<i>Yes: 36.8% No: 63.2%</i>
	Covering required content:	<i>Knowledge in the same domain: 15.8% Covering most of the topics: 58% All required topics covered: 26.2%</i>
	Quality of the online learning process (Quality influences the decision of equivalence):	<i>Yes: 84.2% No: 15.8%</i>
<b>Students: UH + PSUT</b> (83 respondents: UH: 36 and PSUT: 47 students)	<b>Criteria</b>	<b>Response %</b>
	E-learning system:	<i>Yes: 79.5% Yes But: 13% No: 7.5%</i>
	Readiness for e-learning:	<i>Yes: 78% Yes But: 8% No: 14%</i>
	Evaluation and assessment schemes:	<i>Yes: 72.8% Yes But: 12% No: 15.2%</i>
	living and cost conditions:	<i>Yes: 65% Yes But: 12% No: 23%</i>
Virtual international study program		
<b>Management and professors at UH - master of MIS</b> (8 respondents)	<b>Criteria</b>	<b>Response %</b>
	Inclusion of virtual students:	<i>Yes: 48.5% Yes But: 39% No: 12.5%</i>
	UH online courses:	<i>Yes: 52.3% Yes But: 20% No: 27.7%</i>
	UH courses replaced by MOOCs:	<i>Yes: 37.5% Yes But: 62.5% No: 0%</i>
	Student cannot select a course himself	<i>Yes: 78% Yes But: 10% No: 18%</i>
<b>Students UH + potential candidates students at PSUT</b> (55 respondents)	<b>Criteria</b>	<b>Response %</b>
	E-learning system:	<i>Yes: 76.5% Yes But: 13% No: 10.5%</i>
	Readiness for e-learning:	<i>Yes: 75% Yes But: 10% No: 15%</i>
	Evaluation and assessment schemes:	<i>Yes: 70.8% Yes But: 12% No: 17.2%</i>
	Thesis work:	<i>Yes: 42.3% Yes But: 12% No: 45.7%</i>

The flipped classroom methodology has been applied in the two virtual study programs such that UH professors designed content which students must complete at home before coming to class. The contents include a set of educational videos and exercises available for students for an entire month prior to the classroom session at their home university. During the face the face lessons, more complex activities than the exercises of the online ones, which included solving problems and questions related to the content presented by the videos in the online phase. On the other hand, students were allowed to ask questions related to the content presented in the online phase.

The assessment process was performed by means of paper exams, which are sent to UH professors to correct and a percentage of the grade is dedicated to the course work and the amount of time students interact during the online phase.

## 5 CONCLUSIONS

The adoption of MOOCs by students and management of two partner universities, PSUT in Jordan and University of Hasselt in Belgium, in study programs are promising as they suggest that virtual study programs are accepted in both Universities. However, professors in both universities elucidate concerns on accepting the equivalence of the MOOC courses to their own courses.

The results reveal that the realization of the virtual exchange study program can be further tested. A few equivalent MOOC courses have to be identified and scheduled as part of a test-curriculum, organized in parallel with the regular curriculum. The curriculum council has to evaluate the courses and decide on the number of credits that can be earned. Students included in the test will evaluate their experience at the end of the academic year resulting in improved conclusions about the adoption of the MOOCs in the university.

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