

Are higher education students registering and participating in MOOCs? The case of MiríadaX

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Abstract

Most MOOCs offer open learning opportunities at Higher Education (HE) level. However, it is still unclear how HE students are taking this type of course. This study focuses on the profile of HE students participating in MOOCs, their registration, preferred topics and completion patterns and how they compare to other types of participants. The paper presents a descriptive analysis of the MiríadaX platform data up to the end of 2014, including an analysis of 144 courses and 191,608 participants. Results indicate that current HE students, who are mostly Latin American and Spanish males interested in technology subjects, register for and complete lower numbers of MOOCs than participants who have already completed their HE studies. HE students older than standard ages have a significant presence in MOOCs and have higher numbers of MOOC registrations and completions.

Keywords

MOOCs, MiríadaX, higher education, student profile, data-driven analysis

1 Introduction

Many universities have opened up courses to diverse target groups by delivering them in Massive Open Online Course (MOOC) platforms (KOVANOVIC, JOKSIMOVIC, GASEVIC, SIEMENS & HATALA, 2015). This is generating increasing options for the population to organize their learning, which some authors argue can lead to disruption in Higher Education (HE) (JANSEN & SCHUWER 2015; SANCHO, OLIVER & GISBERT, 2015; BOVEN, 2013). This situation poses research questions to better understand the social phenomena behind MOOCs so that data-based consideration may be made on their potential future implications and the elaboration of strategies at the level of HE institutions, MOOC platforms, educational policy makers, and so on (SIEMENS, GASEVIC & DAWSON, 2015; JORDAN, 2014).

In particular, this paper examines the extent to which HE students are taking MOOCs in addition to their formal learning courses at their universities. While only few MOOCs are recognized with credits by particular institutions (JANSEN & SCHUWER 2015) or used in a blended learning approach in residential universities (ALBÓ, HERNÁNDEZ-LEO & OLIVER, 2015; DELGADO KLOOS et AL., 2015; ADONE et AL., 2015), most MOOCs represent informal or non-formal learning actions to the participants (JANSEN & SCHUWER 2015). This line of research can provide society and universities information about the profile of HE students actually interested in additional courses, the subject areas of those courses and their completion rates (YUAN & POWELL, 2013). Moreover, MOOC providers and platforms could benefit from understanding the behaviour of these specific segment of their participants, when compared to other types of participants (e.g., participants not involved in HE and without a degree or participants having completed a degree), to personalize course recommendation or support decisions on the creation of new MOOCs (SIEMENS, GASEVIC & DAWSON, 2015).

The paper aims to answer the following research questions:

- R1) What is the profile of the typical higher education student involved in MOOCs?
- R2) What is the average number of MOOCs that higher education students register?
How this average number compares to other MOOC participants?
- R3) What is the average number of MOOCs completed by higher education students?

How this compares with other MOOC participants?

R4) What are the thematic selected/registered by higher education students? How this compares with other MOOC participants?

To answer these questions, the paper uses data from the MiríadaX platform which is the main Spanish MOOC provider, promoted by Telefónica, Universia and Banco Santander (MiríadaX, 2013). MiríadaX offers MOOCs since 2013, most of them in Spanish, and only few are in Portuguese and English. The data used for the analysis has been provided by Telefónica Digital Education to the authors in the context of the Cátedra Telefónica-UPF (Cátedra Telefónica-UPF, 2013).

The remainder of this paper is structured as follows. Section 2 describes the methodology followed to analyse the data. Results presented in Section 3. Finally, Section 4 includes the main conclusions of the study.

2 Methodology

This study is based on a quantitative analysis from MiríadaX data regarding 144 MOOCs which were completed in late 2014. The analysis combines data from two datasets (participants and courses) and applies descriptive statistics to offer results for each research question. Data from participants is provided by two data sources. On the one hand, from the questionnaire which participants respond voluntarily when registering to the MOOC platform. These data include the country of origin, gender, age and education information. On the other hand, data provided automatically by the platform in log files: the number of MOOCs registered and completed for each participant as well as in which courses they have enrolled in. Regarding the data from the courses, the information available refers to the course description, including dates, number of enrollment, and topic.

The global numbers of the two databases offer data from 291.608 participants and 144 courses. Despite this, it has to be taken into account that the final sample changes in the case of the participants data, because part of the information is obtained from a voluntary questionnaire with the following final figures: Country of origin: 94.844 participants have replied (32% of all); Gender: 53.455 participants have replied

(18,33% of all); Age: 50.734 participants have replied (17.40% of all); and Education: 87.310 participants have replied (29,94% of all).

3 Results

In this section, the results related to three main themes are discussed: (1) the profile of higher education students involved in MOOCs; (2) the average number of MOOCs that each student registers for and completes, as well as completion rates; and (3) the subject area preferences of higher education students compared to other types of participants.

3.1 Profile of higher education students involved in MOOCs

The majority of the higher education (HE) students taking MOOCs in the MiríadaX platform are male, at 62.06% of the total (Figure 1). This proportion reflects the overall distribution by gender of users of the MiríadaX platform, which is 60.70% male and 39.30% female. This same trend is also observed in the case of the Coursera platform, where females constitute 40% (PIERSON & CHUONG, 2014). Moreover, regarding differences by age, the percentage of males is higher than that of females in all cases (Figure 1).

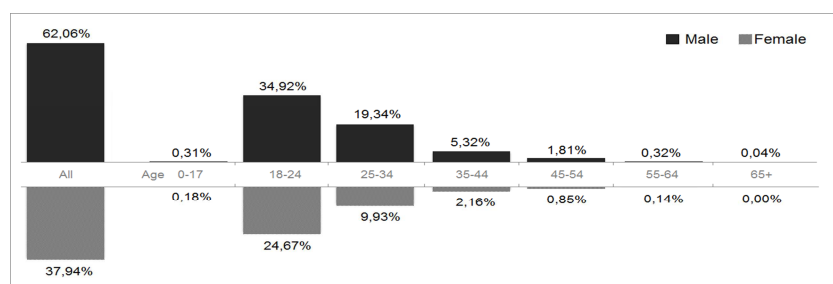


Figure 1: HE students registered in courses by age and gender (N=13.692)

The most common age of higher education students involved in MiríadaX courses is 18-24 years (59.59%). This is an expected result because it is the typical age range for

studying at university after completing high school. Despite this, it is worth noting that there are also older higher education students enrolled in MOOCs: 25-34 years (29.27%), 35-44 years (7.48%) and over 45 years (3.16%).

Table 1 shows the number of total higher education students enrolled in MiríadaX courses by their country of origin. The students come from 79 different countries, but mainly from Spain (41.01%) and Latin America (57.5%). The table only shows the specific data of the most common 24 countries since the remaining ones each contributed less than 0.10% of the participants. The Latin American countries with the most students enrolled in MiríadaX are Colombia (16.03%), Mexico (9.87%) and Peru (7.49%). However, Peru has the highest number of MOOC enrollments per student (4.9) while Colombia has the lowest (2.42). The high proportion of Spanish and Latin American HE students in MiríadaX courses is determined by the languages in which the platform offer MOOCs, with Spanish being the principal one.

Table 1: HE students enrolled in MiríadaX MOOCs and registrations per student by country of origin.

	FREQ.	CUMUL. FREQ.	%	CUMUL. %	MOOCs REGIST. /STUDENT	SD
Spain	10.690	10.690	41.01	41.01	3.93	5.46
Colombia	4.178	14.868	16.03	57.04	2.42	3.60
Mexico	2.574	17.442	9.87	66.91	3.59	5.48
Peru	1.952	19.394	7.49	74.40	4.90	6.48
Argentina	1.108	20.502	4.25	78.65	3.11	3.96
Venezuela	912	21.414	3.50	82.15	3.66	6.71
Ecuador	782	22.196	3.00	85.15	3.12	4.46
Chile	697	22.893	2.67	87.82	3.55	5.24
Brazil	635	23.528	2.44	90.26	2.76	4.12
Dominican Repub.	406	23.934	1.56	91.82	3.09	3.58
El Salvador	329	24.263	1.26	93.08	2.88	3.88
Guatemala	276	24.539	1.06	94.14	3.61	4.33
Bolivia	189	24.728	0.73	94.86	4.72	6.23
Uruguay	189	24.917	0.73	95.59	3.59	5.18
Costa Rica	185	25.102	0.71	96.30	3.17	3.80
Paraguay	154	25.256	0.59	96.89	3.97	4.85
Honduras	146	25.402	0.56	97.45	2.61	2.91
Nicaragua	120	25.522	0.46	97.91	3.11	3.86
Portugal	107	25.629	0.41	98.32	3.64	5.61
Puerto Rico	101	25.730	0.39	98.71	2.55	2.77
Panama	55	25.785	0.21	98.92	3.69	5.38
United States	39	25.824	0.15	99.07	3.31	4.46
France	28	25.852	0.11	99.18	2.75	3.13

Germany	27	25.879	0.10	99.28	4.19	4.51
55 countries	<25/country	26.067	<0.10/country	100	---	---
TOTAL	26.067	---	100	---	---	---

3.2 Number of MOOCs

In this section, three indicators are analysed in relation to HE students taking MOOCs on the MiríadaX platform: the average number of courses enrolled per student, the average number of courses completed per student, and finally, the ratio between courses completed and courses registered for per student.

The results show that on average, HE students register of 3.56 courses each and complete on average 0.55 courses (Table 2). The results are similar to other types of participants on the MiríadaX platform, though one can note that participants without university degrees are enrolling in and completing fewer courses per student (2.81 and 0.46, respectively). Participants who already hold university degrees, professors, researchers, and university support and technical staff tend on average to register for similar numbers of MOOCs, but their average completion rate is higher than that of HE students.

The third indicator in Table 2 also supports this finding. Participants without university degrees complete 11.84% of the courses they enroll in, while HE students complete on average 12.87%. Results are higher for the other types of participants: while professors or researchers complete 15.50% and university staff 16.27% of the courses they register for, those participants with university degrees (not including professors, researchers, and university support staff) have the highest completion rate (19.88%).

Table 2: Average number of MOOCs registered for and completed per HE student and completion rates per HE student compared that of other types of participants.

(Averages)	TYPE OF MIRÍADAX PARTICIPANTS				
	HE student	Without university studies	With university studies completed	Professor or Researcher	Uni. support / technical staff
MOOCs registered / HE student	3.56	2.81	3.40	3.69	3.41
MOOCs completed / HE student	0.55	0.46	0.81	0.71	0.70
Completion rate / HE student (%)	1.87	11.84	19.88	15.50	16.27

Table 3 breaks out these three indicators of HE students by gender and age. The results do not reveal significant differences by gender: males on average enroll in 3.84 courses and finish 0.58; while females enroll in 3.69 and finish 0.54 courses. Completion rates show similar patterns for both genders.

Table 3: Average number of MOOCs registered for and completed per HE student and completion rates per HE student (by gender and age)

(Averages)	GENDER		AGE		
	Male	Female	0-24	25-44	44+
MOOCs registered / HE student	3.84	3.69	3.55	4.06	4.51
MOOCs completed / HE student	0.58	0.54	0.46	0.70	1.21
Completion rate / HE student (%)	11.39	11.77	10.33	13.31	19.84

In contrast, clear differences can be noticed between different age groups. Older HE students are enrolling in more courses than younger ones, as well as finishing more courses and having higher completion rates. All three indicators show higher values as the age of HE students increases. HE students below the age of 24 enroll in an average of 3.55 courses and have a completion rate of 10.33%. Students from 25-44 register for 4.06 courses per student and have a completion rate of 13.31%. Finally, students older than 44 register for the highest number of MOOCs per student (4.51) as well as have the highest completion rate (19.84%). It is necessary to point out that a limitation of this analysis is that it ignores the registration date of participants on the platform. The omission of this information may be introducing a bias in results; this bias should be considered in the interpretation of data and will be considered in future analyses.

3.3 Course subject preferences of higher education students

Figure 2 shows the number of registered participants by subject area of the courses offered by MiríadaX –the course subjects used in the analysis are those defined by the MOOC platform-. To sort the different subject's areas on the horizontal axis it has taken as a reference the percentages of HE students per subject area - these are ordered from highest to lowest percentage of registrations of this type of participant, therefore, from highest to lowest preferences of this particular group-.

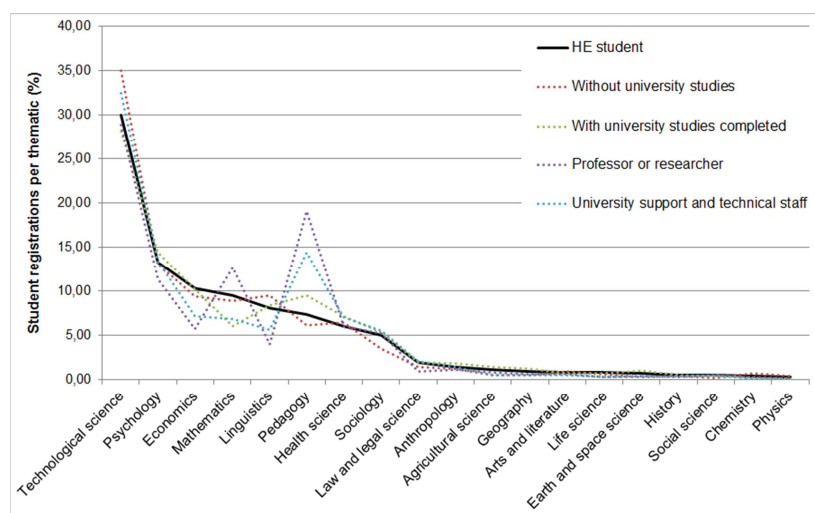


Figure 2: Distribution of registrations per courses' subjects by types of participants.

The subject area preferred by HE students is technological science (30%), while the second is psychology (13.27%) and in the third place economics (10.39%). The following are mathematics (9.52%) and linguistics (8.09%). Participants who have finished university degrees share these first three preferences although with different percentages (28.17%, 14.47% and 10.21% respectively). Technological science is also the subject area with the highest percentage of registrations by the rest of types of participants, and chemistry and Physics the less demanded by all participants' types.

Professors or researchers differ to HE students in showing notable preferences in pedagogy (19.09%) and mathematics (12.69%) areas. They also show lower levels of preferences for economic courses and linguistics. Furthermore, pedagogy is also being remarkably preferred by the university support or technical staff, and by the participants with higher education degrees completed.

After analysing the student preferences and differences with other participants, it is also studied how distributed these groups are within each subject area (Figure 3). One of the first results from this graph is that although being physics the subject area less preferred by the HE students, it presents the highest percentage of this type of partici-

pants in its registrations distribution –44.69% of the participants of physics courses are HE students–. In addition, in the others subject areas HE students represents less than 40%, being pedagogy the subject area least represented by this type of participants (21.87%), as previously mentioned.

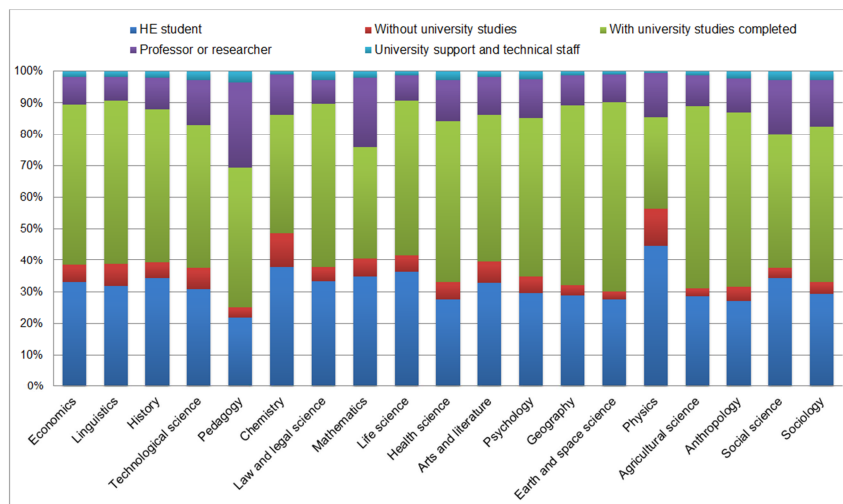


Figure 3: Distribution of the course participants within each subject area.

Finally, in order to contextualize the above results, it is necessary to consider the number of courses offered by the platform in each subject area to understand if the number of registrations has been influenced by it. In this way, figure 4 shows the number of participants' registrations per thematic normalized by the number of MOOCs offered per each subject area. Therefore it is showing a visualization of courses offered against demand depending on the type of participants. Behavior among different groups of participants is quite similar for most categories. Differences are found, in the area of pedagogy where the demand by the group of professors or researchers is higher than in HE students. In this graph it can be also observed if the different subject areas are balanced in relation to the courses offered and the number of participants enrolled in. Aligned with this, linguistics, psychology and earth and space science present a higher "saturation" as they have the highest numbers of participants' registrations per course

(4.273, 2.707 and 2.282 participants/course respectively). At the same time, physics and chemistry present the lowest ratio (320 and 335 participants/course respectively).

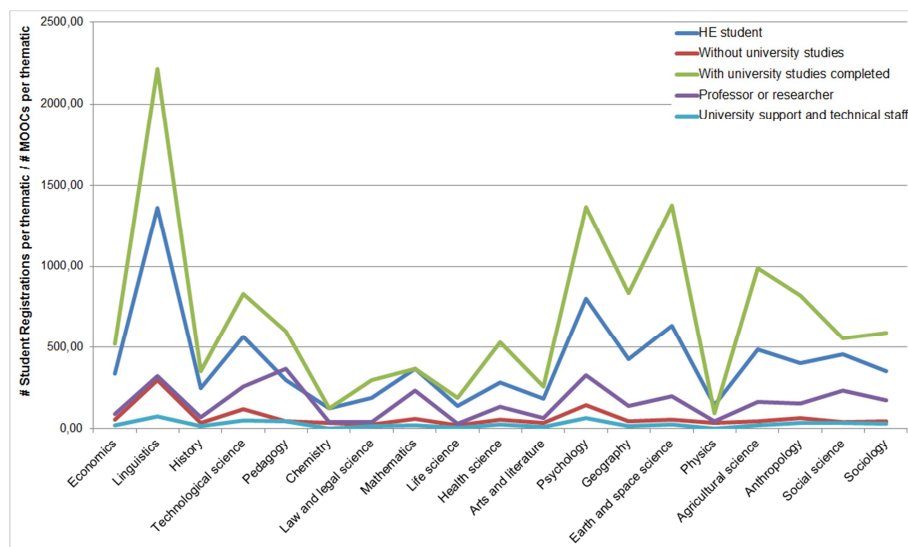


Figure 4: Registrations per topic normalized by the number of MOOCs per subject.

4 Conclusions

The obtained results answer the research questions raised in the introduction. Regarding the profile of HE students involved in MiríadaX MOOCs (RQ1) (data collected since MOOCs started to be published in MiríadaX in 2013 up to the end of 2014), results show that there is a majority of male (60.70%) in a range of 18-24. Interestingly enough, there is an important number of HE students participating in MOOCs with ages as from 24 (40%). Most HE students are from Latin American countries (57.5%) and Spain (41.01%).

Concerning the average number of MOOCs that HE students register for and complete, and how this compares to other types of MOOC participants (RQ2, RQ3), we can say that HE students register for on average of 3.56 courses completing only 0.55 courses

(similar pattern when comparing men and women). Though results show a similar trend for the other types of participants, participants without HE degrees register for and complete a slightly lower number of courses, and participants with a HE degree register for and complete a higher number of courses. Interestingly, HE students as from 24 years old register for and complete more MOOCs than standard-age HE students.

Finally, with respect to the topic registered for by HE students and how this compares with other participants in MiríadaX (RQ4), it is interesting to see that MOOCs in the technological science subject area, followed by psychology and economics, show higher percentages of registrations for all types of participants. Professors or researchers differ to HE students in showing notable preferences in pedagogy (19.09%) and mathematics (12.69%). In the physics subject area, HE students represent the highest percentage of types of participants registered.

Overall, we can conclude that HE students are taking MOOCs following a pattern of registration and completion of MOOCs in between participants without HE studies (lower numbers) and with HE studies completed (higher numbers). Within the collective of HE students, those more active are older than 24, representing profiles of stronger intrinsic motivation to learn or to improve their professional competences. One interpretation is that MOOCs are generally perceived as useful lifelong learning opportunities and not that much as a resource (comparable e.g. to books) that can support the HE curriculum. The particular result for the case of physics subject may be explained by a use of these MOOCs as remedial (level O) courses for freshmen at universities (DELGADO KLOOS et AL., 2014). The recent initiatives on the use of MOOCs to support blended educational approaches (ALBÓ, HERNÁNDEZ-LEO & OLIVER, 2015) may influence the future evolution of the trends identified in this paper.

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