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DISCIPLINARY AND DIDACTIC PROFILES IN EDUOPEN NETWORK MOOCS

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This paper describes the quantitative and qualitative characteristics of the massive open online courses (MOOCs) available in the EduOpen platform. In particular, data (analytics) concerning the variables didactic disciplines and didactic structuring are presented to identify main trend lines and potential critical aspects. Useful elements emerge to enhance our understanding of the main characteristics of the MOOCs offered by the EduOpen network, in particular: a) the quantitative dimensions of MOOC supply and demand, in which a greater flow of enrolment towards courses of a scientific and technological nature is evident; b) the degree of didactic structuring of the courses, where the presence of assessment tools appears to be the element that especially characterises the didactic structure of the EduOpen MOOCs. The conclusions suggest awareness-raising actions to build dashboards that can report to instructors and students in real time the critical and necessary action issues and therefore provide useful guidance both to prevent risky situations and to support teachers in the design and development of new courses.

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1 Introduction

The very name massive open online courses (MOOCs; Conole, 2013) clearly indicates the elements that characterise this type of course: a large number of students, the centrality of the network for educational communication and the openness of access to the educational resources. These characteristics condition the process of designing, developing and delivering the MOOCs. A further element of complexity, from the design point of view, is given by the heterogeneity of the cultural and socio-economic characteristics of the recipients determined by the massive nature of participation.

EduOpen[1] is a project funded by MIUR[2] to create an Italian platform for the delivery of MOOCs and was developed from a standard release of Moodle. A series of factors – including the knowledge and sharing of good practices, the results of research conducted at the international level and the regulatory guidelines provided by the Italian body for the evaluation of academic and research activities (ANVUR) – led the EduOpen network to develop the Guidelines for Educational Design of MOOCs. The Centro Edunova team has also taken over the validation procedures for the MOOCs published on the EduOpen portal, based on checklists and intense interaction with the participants in the courses and with the educational managers of the individual universities participating in the network. This interaction has resulted in ideas, suggestions and proposals that have allowed the identification of some educational and technological principles that have a relevant, and sometimes binding, role in the design and production of MOOCs.

After an introductory reflection on the state of the art and on the main numbers and characteristics of the EduOpen project, this paper describes the analysis conducted on the disciplinary profiles of the educational offer of the universities belonging to the network (i.e. the content and disciplinary areas at the base of the individual MOOCs) and on the demand expressed by the participants through enrolment in individual courses (section 1). Finally, the discussion highlights some of the fundamental elements for the didactic structuring of courses (sections 2, 3 and 4).

2 Academic analytics

Now days society is facing constantly the growing challenge posed by "big data", 'datasets whose size is beyond the ability of typical database software tools to capture, store, manage and analyse' (Manyika *et al.*, 2011). The educational area sees a widespread introduction of virtual learning environments

[1] https://learn.eduopen.org

[2] Ministero dell'Istruzione dell'Università e della Ricerca

(VLEs) – also known as learning management systems (LMSs[3]) – which place educational institutions as well to deal with increasingly large sets of data. Day by day, these systems collect and store increasing amounts of interaction data, personal data, systems information and academic information (Mazza & Milani, 2004; Romero *et al.*, 2008).

(Campbell *et al.*, 2007) proposed that academic analytics is emerging as a new tool inside the waste field of Learning Analytics that can address what seem like intractable challenges. Campbell and Oblinger (2007) set out a definition of academic analytics. This definition links the technological aspects as, 'Academic analytics marries large datasets with statistical techniques and predictive modelling to improve decision making', with the educational ones as, 'academic analytics has the potential to improve teaching, learning, and student success', in the context of the political, 'by 2020 the overall portion of the U.S. workforce with a college degree will be lower than it was in 2000'.

As suggested by Siemens (2010), as some overlap exists between the learning and academic analytics, it is still possible to distinguish the two fields. While learning analytics are focused on the educational challenge: that is "how can we optimise opportunities for online learning"? The academic analytics are focused on the political/economic challenge: "How can we substantially improve learning opportunities and educational results at national or international levels"? In a nutshell, we might say that academic analytics is not strictly about "learning", but rather about the network within which it takes place, as a macro level of analytics.

3 Research questions and methodology

The research questions underlying this work are:

- What are the constituent (structural) elements of an EduOpen course that most frequently recur in a teacher's choices?
- Which are the most common disciplinary fields in EduOpen's educational offer and to what extent do they cross with the demand expressed by the portal's enrolled students?
- In consideration of the data collected, if there is any, what is the useful or relevant information in a dashboard construction process?

In order to answer the questions listed above, the methodology developed consisted in activating a data collection inherent to the research dimensions.

For the purposes of this work, data was collected through the extraction from the extensive EduOpen dataset. As an LMS, this data relates to the

[3] Such as Blackboard and Moodle

students' interactions with the system, their personal data and a selection of data concerning the educational offer and the course structure. Different levels of data are compared with the intent to cross the "deepest" ones, the data concerning individual interactions and personal data, with the "higher ones", educational offer and political decisions.

4 State of the art/context

The EduOpen network can be briefly described through the following statistics:

17 partner Universities + 2 Associated Members
174 active courses
114 archived courses
20 active pathways
11 archived pathways
6 courseware types
55,286 total users
44,821 active course learners
33,818 certificates issued
(Data updated July 2019)

The majority of time spent by users on the portal is spent inside courses (38,854 h/40,358 h: 96.2%), which is consistent with the ultimate purpose of a MOOC portal (Conole, 2013, p. 6). Only recently, with the transition to version 2.0 of the platform has the renewed dashboard and EduOpen blog[4] increased platform spaces outside the courses, which are used by users and the Edunova team to collect and exchange information.

EduOpen member personal profiles

Regarding user type, it is possible to determine their academic status (students vs. non-students) and distinguish between different access types for registration to the platform: those who have federated[5] access form about a quarter of the total (25.2%), mostly identifiable as students enrolled in one of the partner universities of the network; remainder (74.8%) are registered to the platform with a private account. Although we can say with certainty that a quarter of the subjects registered on the portal are university students, we cannot also say with the same degree of certainty that the remainder (74.8%) are all non-university students. In fact, a university student could still use a personal account to register with EduOpen.

[4] https://learn.eduopen.org/blog/

[5] IDEM-GARR Federation and GEANT-EDUGAIN Federation

Concerning the geographical origin of the platform users, the data are not available for 11,036 users for a variety of – primarily technical – reasons. Excluding these from the total user count, 95.5% of EduOpen members come from Italy (42.414), followed by Brazil 0.4% (170 users), Spain 0.3% (138 users), Germany 0.25% (127 users) and the United Kingdom 0.25% (127 users). The most common language among members is Italian (87.3%) followed by English (8.8%) and Spanish (1%). The remaining 2.9% use other languages.

Table 1
MOST COMMON COUNTRIES OF ORIGIN OF EDUOPEN MEMBERS (JULY 2019)

Member countries of origin	
Italy	42.414
Brazil	170
Spain	138
Germany	127
United Kingdom	123

EduOpen users are predominantly women (59%) and have an average age of 36.5 years.

Table 2
DISTRIBUTION OF EDUOPEN USERS BY AGE GROUP (JULY 2019)

Age group	%
18-24	21.21
25-34	32.09
35-44	20.87
45-54	15.58
55-65	7.05
> 65	3.19

Among the tools and resources[6] most used by the users in EduOpen, EduPlayer[7] stands out with a 56.6%, followed by Quiz (17.3%) and Forum (11%). These data indicate that most of the courses in the EduOpen catalogue, from the didactic point of view, make use of video lectures, discussion groups and some type of test-based evaluation.

[6] These data were obtained by analysing the time spent by users (timespent) for each activity/resource listed.

[7] A plugin designed for viewing the EduOpen video lectures developed in collaboration between the Edunova centre and LMS of India

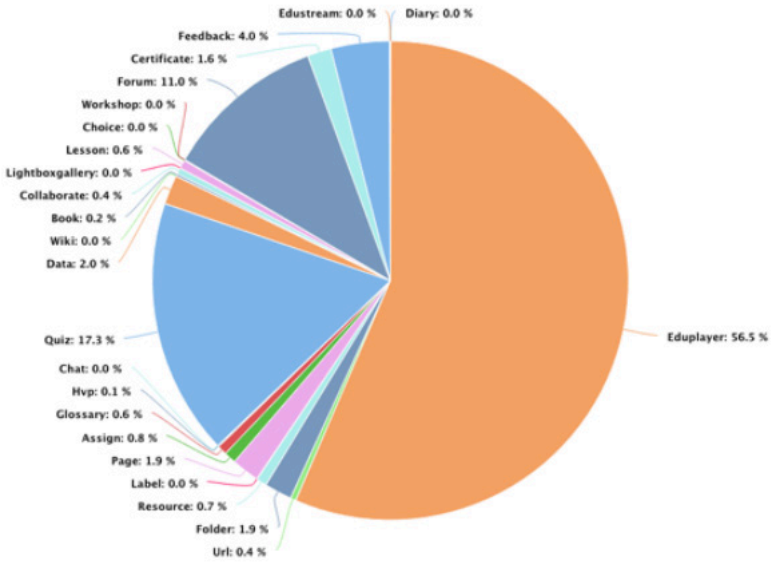

Fig. 1 – Most frequently used activities and resources

EduOpen disciplinary areas

As of July 2019, the EduOpen platform provides 288 courses, 174 of which are active and 114 archived[8]. Some of these courses are also structured into pathways – that is, MOOCs composed of multiple courses centred on a single field of knowledge and linked together to supply more complete and articulated content. EduOpen's educational offer is organised in a catalogue divided into 6 specific categories: Arts and Humanities; Computer and Data Sciences; Health and Pharmacology; Sciences; Social Sciences and Technology, Design and Engineering.

Table 3
COURSES WITH THE HIGHEST NUMBERS OF REGISTERED USERS (JULY 2019)

Course / # Members			
Precorso di Calcolo (Sciences)	5211	Methodologies and practices for Digital Augmented Education (Social Sciences)	1592

[8] A course or a path can be archived for two reasons: the content is no longer current, or a new "tutored" and/or updated edition is planned. It is important to note that the video lessons and activities of the archived training courses remain accessible only to the students enrolled in the archived courses; it is no longer possible for new users to enrol in archived courses and paths or to acquire a participation certificate and the open badge.

Web communication and digital marketing (Social Sciences)	2389	How's my English? (Social Sciences)	1588
Digital natives, a new way of learning (Social Sciences)	2185	Fundamentals of Information Technology (3rd ed.; IT, Data Management and Analysis)	1452
Learning to learn: DSAs in the School of Competence (2nd ed.; Social Sciences)	2061	From data to information (IT, Data Management and Analysis)	1449
Introduction to R (IT, Data Management and Analysis)	1655		

Figure 2 shows the different content categories in which the active and archived EduOpen portal MOOCs have been grouped. The category with the most relevant course offerings is Social Sciences, which alone represents more than half of the total offer (52%), followed by Arts and Humanities (15%), Computer and Data Sciences (12%), Science (11%), Health and Pharmacology (6%) and Technology, Design and Engineering (4%).

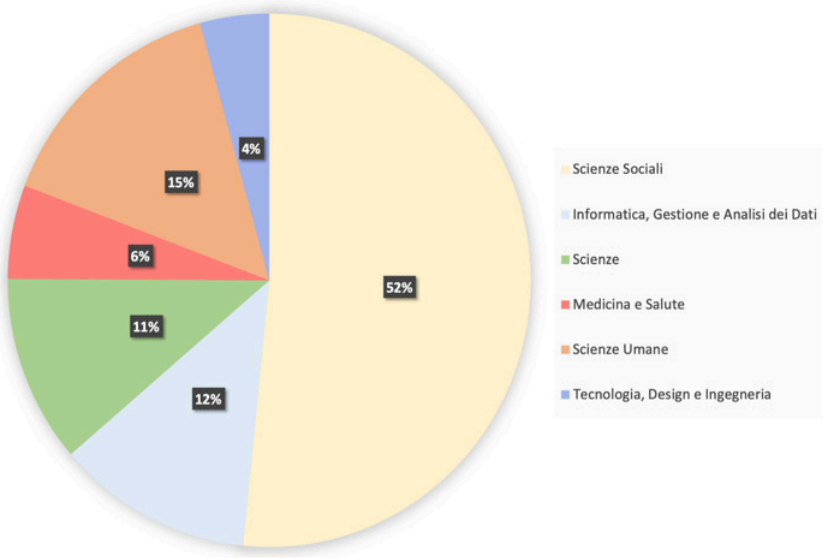

Fig. 2 – Disciplinary categories of EduOpen course catalogue (July 2019)

The situation is quite different if we analyse the disciplinary offer of the pathways, which have a wider and more complex structure (Figure 3). The two categories Science and Technology, Design and Engineering are not present at all in a pathway catalogue, while 58% of the offer belong to the Social Sciences category and 26% to Computer and Data Sciences.

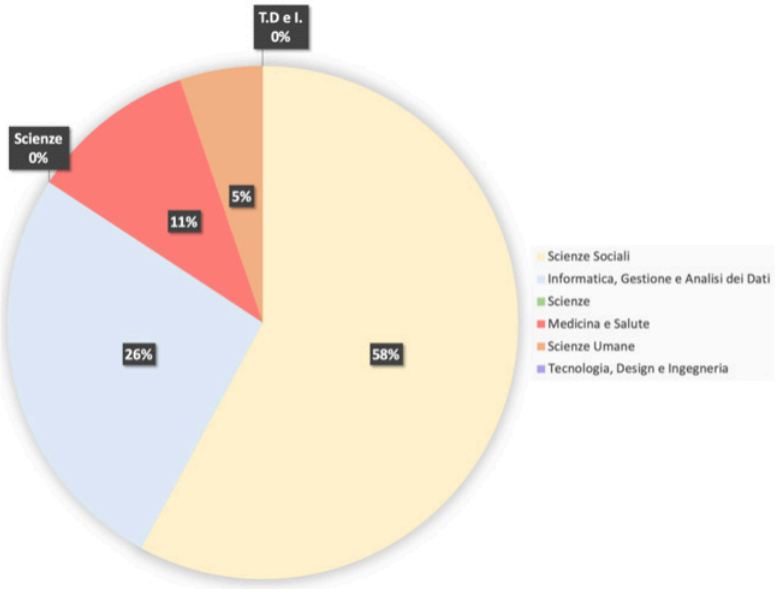

Fig. 3 – Distribution of EduOpen pathways by content category

Figure 4 shows the distribution of the MOOC enrolment by content category. Almost half of the participants in EduOpen MOOCs (49%) chose to enrol in courses belonging to the Social Sciences category, while the remaining enrolment choices were distributed as follows: 17% chose courses in the Computer and Data Sciences category, 14% chose courses in the Science category, 12% chose courses in the Arts and Humanities category, and finally, the Health and Pharmacology category was chosen by 6% of the students and the Technology, Design and Engineering category only by 2%.

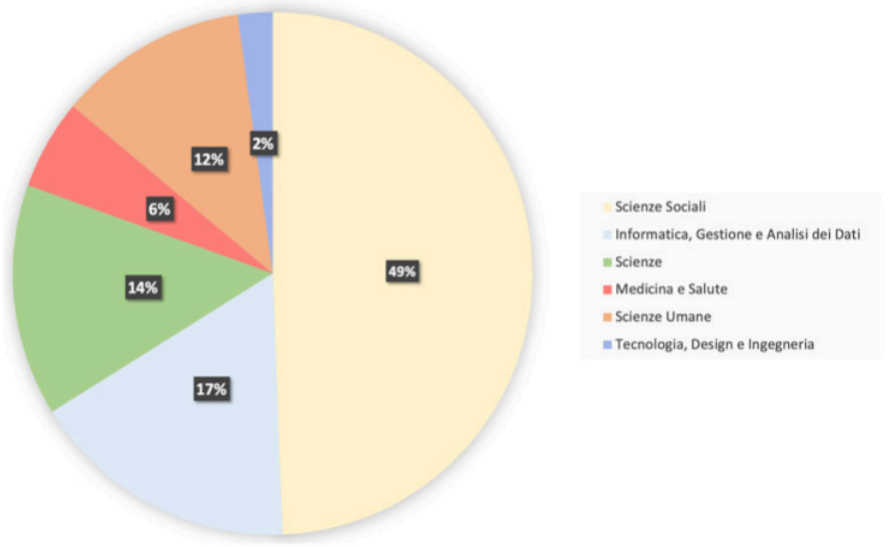

Fig. 4 – Distribution of member enrolment by content category

Table 4
DISTRIBUTION OF MOOCS AND MEMBERS BY CONTENT CATEGORY (JULY 2019)

Content Categories	% of MOOCs	% of members
Social Sciences	52%	49%
Arts and Humanities	15%	12%
Computer and Data Sciences	12%	17%
Science	11%	14%
Health and Pharmacology	6%	6%
Technology, Design and Engineering	4%	2%

Table 4 summarises the data presented in Figures 2 and 4. With all due caution, we may consider the data in the second column of Table 4 to refer to the educational offer and the third column as referring to the demand/request. The need for caution mainly concerns the demand-side, because it is very likely that it has been conditioned by the academic nature of the offered courses. Even if, as we have seen before, university students represent only 25% of the total members of the EduOpen network, we are not sure that the remaining 75% do not belong to a university. In other words, the demand would be very close to the university departments that produced the offered courses. The proximity of the values of columns 2 and 3 seems to confirm this hypothesis. The fact that in two cases (Computer and Data Sciences and Science) the percentage of

students enrolled in a given category is higher than the percentage of the same category for the total EduOpen offer could simply tell us that the courses in that category are the most populated by students.

This conclusion could be corroborated by additional data that concerns the number of visits (i.e. the data that can be obtained once a user has logged into a course followed by the subsequent opening of a specific activity or resource) for each course.

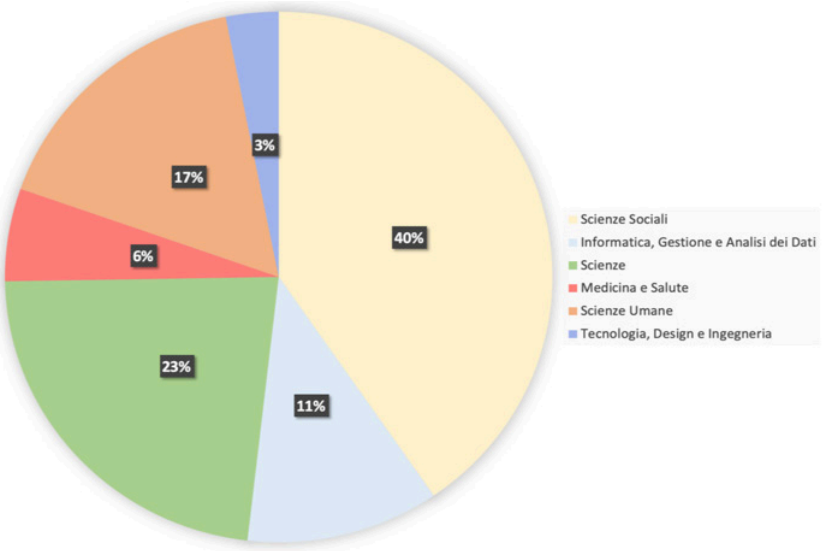

Fig. 5 – Distribution of user course visits divided by category

Courses belonging to the Social Sciences category, which represent 52% of the EduOpen catalogue (Offer), received only 40% of visits, while courses in the two categories Computer and Data Sciences and Science, which together account for 23% of the catalogue, collectively collected 34% of visits.

Structuring of didactic/teaching models

While noting that "empirical evidence on the effectiveness of MOOC's pedagogy is hard to find" (Swan *et al.*, 2014), when referring to this type of online course, we cannot avoid reflecting on the themes of didactic planning and evaluation. The elements of design and evaluation are linked in a self-feeding circle: the characteristics that make online courses for a wide audience more interesting and effective can become key elements of the didactic design

of new models, and quality evaluations can confirm the correctness of the theoretical hypotheses resulting in variations in the field of learning design.

As far as the structuring of the EduOpen MOOC offer didactic models is concerned, it is primarily centred on the EduOpen Didactic Design Guidelines (see also Limone *et al.*, 2016), as well as on the validation checklist, which is a series of indicators that helps verify that the standard quality elements required by the EduOpen guidelines have been respected. The definition of the Guidelines for the EduOpen MOOC Educational Design was developed starting from the sharing of best practices, indications derived from scientific research and regulations provided by Italian bodies for the evaluation of academic activities. The definition of a unitary didactic planning style, although respecting the specificities of each university, the didactic preferences of each instructor and the teaching needs of each discipline, was followed by the clarification of course validation criteria developed for online publishing. According to EduOpen network guidelines, course validation is the seventh step in the production flow and is intended to verify the adhesion of the courses to the EduOpen consortium guidelines and to the technical settings of the portal (De Santis *et al.*, 2017).

In an in-depth study to detect key elements of didactic design and the structuring levels of MOOC didactic models on the EduOpen platform, it is useful to first dwell on the very concept of structuring and its meaning in this context. Intended as a didactic model, a scheme allows the planning, realisation and evaluation of the process of teaching and learning in a specific environment to achieve certain goals; the structuring of the scheme, in the context of EduOpen training courses, refers to a specific subset of the didactic design. More precisely, structuring is where the didactic planning takes into consideration aspects such as the definition and organisation of objectives, methods and didactic activities; the choice of content; the choice and preparation of materials and tools; and the didactic and communicative needs. Structuring in the context of EduOpen responds to the question of what is intended to bind the student to a specific educational path designed and implemented during didactic planning. The identification of the structuring level of the didactic model is therefore a part of the design or an organisational choice about the didactic model and marked by two distinct extremes: high structuring and low structuring.

High structuring is defined as linear educational pathways that bind learners along a well-defined learning sequence. For example, a course or pathway may require students to follow a certain sequence of educational activities by applying conditioning criteria governing the availability of a given activity or resource based on the completion of a prior activity or resource that can reflect propaedeutic requirements or simple organisational needs. Alternatively, course

designers may provide time periods within which a resource is available or during which it is obligatory to complete an activity, thereby binding students to precise time limits. As the course advances, students may be required to overcome certain activities which, in turn, may require a minimum score (sufficiency), thereby confronting students with obligatory assessment tests. A typical example of highly structured programmes in the EduOpen catalogue are the pathways that provide a constraint on the learning sequence, as learning progression is monitored by passing intermediate ("milestone" courses) and final knowledge checks ("capstone" courses), as well as a constraint focused on passing the assessment tests (intermediate and final).

Low structuring refers to didactic models that do not impose constraints on learning sequence, knowledge assessment or time periods. For instance, in a low-structure course it is not necessary for a student to view all of the video lectures before obtaining the certificate, or there is no knowledge verification through assessment tests with a minimum necessary score (sufficiency). In the EduOpen context, the lowest structure that appears in the catalogue is represented by the courses called courseware – that is, all of those areas designed as aggregators of content (videos, materials, documents, or evaluations) that are not fully structured, and therefore cannot be aggregated into a real training course, but are equally useful for deepening the subject of study, but which do not include evaluation tests or any constraints on the learning sequence or time limits. Low structuring is therefore reflected in the impossibility of achieving a participation certificate and the open badge. What, then, are the criteria that determine the level of structuring in the EduOpen educational model?

Identification of structuring level criteria

The EduOpen platform, based on the Moodle LMS core, in addition to the complex system of conditional display of resources and completion criteria for activities, allows the setting of course start and enrolment times, course publication and the availability of activities. The technical solutions adopted in the design phase represent an indication of the model and, at the same time, a support for certain educational/didactic decisions.

This study sought to identify key elements useful in defining the structuring levels of the educational model of the EduOpen platform based on:

- analysis of the Guidelines, in particular the presence of elements considered essential by the network for the implementation of courses and pathways; and
- analysis of the course and pathway validation checklist concerning didactic, graphic and technical aspects related to the description, structure, activities and resources, evaluation and certification.

The analysis has highlighted a series of useful indicators, which can be divided into three distinct dimensions. The first of which is T, the time dimension, which consists of T1, the presence and definition of a time period for the fruition of the course; T2, the presence and definition of a "tutored"[9] phase; and T3, the presence and definition of deadlines for the completion of activities or evaluation methods. The second dimension is S, space, which consists of S1, the presence and definition of restrictions in the articulation sequence of course topics/weeks; S2, the presence and definition of the materials, activities or resources that it is necessary to use or implement; and S3, the presence and definition of the conditional access criteria between the video lectures. The third and final dimension is V, evaluative, which consists of V1, the presence and definition of tools (quizzes, tests, etc.) or activities (projects, drafts, discussions, online interviews, etc.) to evaluate learning and explain the main evaluation criteria applied; V2, the presence and definition of "intermediate" evaluation tools; and V3, the presence and definition of "final" evaluation tools. The obtained indicators, which can be declined in the temporal (T), spatial (S) and evaluative (V) dimensions, allow analysis of courses with a binomial evaluation (presence/absence) for each single element.

Analysis of structuring levels of educational models

Given the extent of EduOpen's educational offer, this analysis focused on a limited number of courses. Based on analysis of the offer content categories, it seemed useful to investigate the set of courses belonging to the Science category and the possible differences with those in the Social Sciences category.

The analysis randomly selected (simple random selection) 15 active courses from the EduOpen catalogue (not courseware and not archived) belonging to these two categories with no other selection filter[10]. The courses (marked by ID number) were then analysed through the checklist of structuring indicators, assigning a value for correspondence to each single item of the three dimensions (T, S and V).

[9] The EduOpen guidelines assume a standardised life cycle for the entire educational offer. The course/pathway is initially published in the catalogue in a pre-enrolment mode (a simple overview with no option to enrol or access the course), followed by the enrolment phase (allows course subscription, but not access). On the course opening date, if scheduled, the tutoring phase begins (teachers are present and available to support students in the forums in a predetermined time period), followed by the self-paced phase (no stable instructor presence or interaction and no deadlines) and finally the archived phase (limited access only for enrolled students).

[10] The applicable filters for searching the EduOpen catalogue include: channel (distinction between courses and courseware); category; institution (list of the 20 institutions belonging to the network that have produced the courses); language (English, French and Italian); status (active, ongoing, soon to be published and archived) and objective (curricular courses, knowledge retrieval, input orientation, teacher training, scientific dissemination and lifelong learning).

5 Results

The randomly courses from the Sciences and Social Sciences categories were evaluated by assigning a point for each item of the checklist when the existence of such a feature was noted. Although such a small number of selected elements cannot represent the population of the EduOpen courses and the level of significance for an analysis of 30 elements is often not adequate to effectively explain the resulting data, we observed that the analysis of the data enabled us to highlight a series of elements that emerged despite the small sample.

Table 5
COURSE STRUCTURING LEVELS (SCIENCES AND SOCIAL SCIENCES)

SCIENCE	325	307	308	223	229	208	209	179	182	183	169	168	163	164	165	dimension weight
T 1																
T 2					1	1		1		1	1	1	1	1		10
T 3							1					1				
S 1				1							1	1	1	1		
S 2				1	1	1			1	1	1	1		1		18
S 3				1					1	1		1	1			
V 1	1	1	1	1	1		1	1	1	1	1	1		1	1	
V 2	1	1	1													27
V 3				1	1		1	1	1	1	1	1	1	1	1	
Struct. Level	2	2	2	5	4	2	3	3	4	5	5	7	4	5	2	→3.6

SOCIAL SCIENCE	352	348	289	341	343	306	322	310	311	297	294	288	286	276	284	dimension weight
T 1																
T 2					1					1	1					4
T 3		1														
S 1		1														
S 2	1	1		1	1		1	1	1	1	1	1	1	1		20
S 3					1			1	1	1	1	1	1			
V 1	1	1	1	1	1	1	1	1		1	1	1		1	1	
V 2		1		1					1	1				1	1	27
V 3	1		1		1	1	1	1			1	1				
Struct. Level	3	5	2	3	5	2	3	4	3	5	5	4	2	3	2	→3.4

The two data sets, Science and Social Sciences, exhibited a distribution of the individual courses that tended to lie between the values of 3 and 4 (out of a maximum obtainable of 9). For the Science set, the average structuring level value was 3.6, while for the Social Sciences it was 3.4. This squeezing down of the value of didactic structuring can be explained by two considerations. The first concerns the fact that the T1 indicator (presence and definition of a time period for the completion of the course) was not found to be positive in any of the 30 cases, and the T3 indicator (presence and definition of deadlines for completion of activities or evaluation methods) was found to be positive only three times. The second consideration, a direct consequence of the first, concerns the whole temporal dimension. The time dimension in the Science set yielded a value of 10 out of a total of 55 (18%), while for the Social Sciences it

accounted for only 4 points out of a total of 51 (7.8%). Neither data set seemed to differ from the other in terms of data variance (Fig. 6).

It therefore appears that some indicators considered important by the EduOpen Guidelines have not been transformed into procedural choices (time dimension) or real didactic actions (T1, T3).

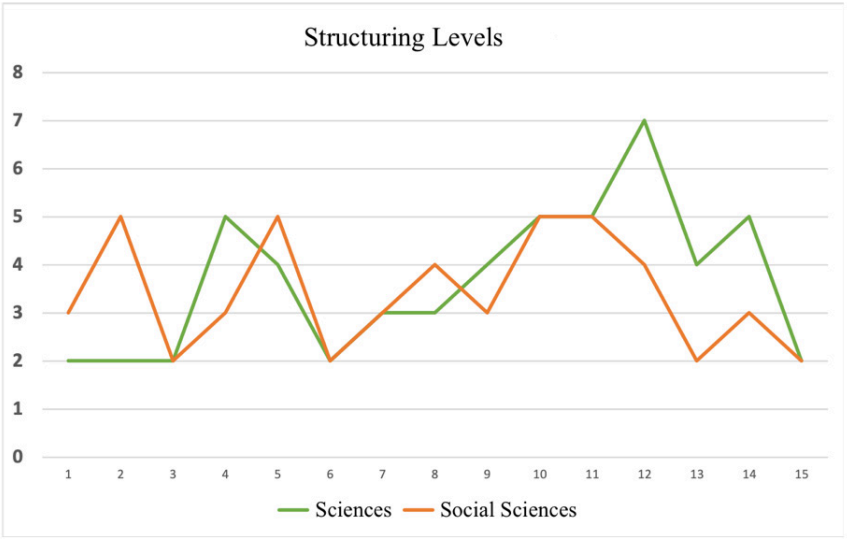

Fig. 6 – Distribution of structuring levels

The two sets of data do not show a particular trend, which suggests that the two categories do not at first sight have different structuring levels. The peak value of 7 and the fact that a lower number of courses belonging to the category of Sciences stands at the minimum value of 2 cannot be considered significant, given the limited sample, as highlighted by the average values for the structuring levels of the two categories.

Concerning the analysis of the structuring levels of the pathways, these, for purely practical reasons (as they just a series of MOOCs, reflect, as a minimum), possessed the same structuring levels as the individual courses of which they are composed. There is also an over-structure intrinsic to the type of modular process corresponding to pathways that binds access to a given course to the completion of the previous one. Access to the final course, called the capstone, is conditioned by the completion of the courses belonging to that same pathway.

Conclusion

While speaking about learning analytics we generally refer to data which benefits learners and faculty and which are focused at the level of courses and department, speaking about the academic analytics we notice a shift in interest towards the level of funders, administrators and marketing at institutional level; funders and administrators at regional level; and governments and education authorities at (inter)national level Long and Siemens (2011).

Analysis of the disciplinary profiles offered in the EduOpen catalogue showed a predominance of courses belonging to Social Sciences category, which covered more than half of the catalogue, to the disadvantage of the categories Health and Pharmacology (6%) and Technology, Design and Engineering (2%). Looking for an answer at the second research question these data indicate the need to rebalance the educational offer through awareness-raising actions and methodological support for the partner universities in the network in the planning and design of new MOOCs in weak categories. It should be noted, however, that the Social Sciences category represents a wide umbrella that includes many different fields (e.g. economics, law, pedagogy and psychology), so that a general review of the EduOpen's catalogue categories could lead to greater representativeness of knowledge and a more precise and recognisable offer. Because the results of the demand-side analysis (enrolment) showed a more consistent flow of users towards courses in the Science and Computer and Data Sciences categories, action should be taken to enlarge the offer of courses related to these categories.

The analysis of the didactic models began with analysis of an already existing and shared MOOC design and validation model through the EduOpen network – that is, the EduOpen didactic design guidelines and the validation checklist. The results of the analysis indicate the importance and role of the evaluative dimension, although the sample considered may be unrepresentative.

The first search question can be answered by the assesment tools, which are useful both to maintain contact between users and the structure of the course and to counter the dropout phenomenon, have proved to be the most followed design indication in EduOpen MOOCs. This is a positive indication and also a reason for satisfaction in the EduOpen network. Analysis of the other dimensions considered shows, however, that it is necessary to act on the resources of the individual universities within the network to encourage greater alignment between didactic practices (the reality of the active MOOCs) and the EduOpen Guidelines (the set of recommendations to ensure the pedagogical quality and effectiveness of the currently active MOOCs and of those that will come in the near future to enrich the EduOpen catalogue).

Finally, concerning the last research question the results of the analysis

thus obtained can be helpful in a study and development process of a new dashboard that takes into account the degree of student engagement and the elements could be "really" useful to monitor their progress in the course such as assessment tools.

REFERENCES

Campbell, J.P., DeBlois, P.B. and Oblinger, D.G. (2007) 'Academic analytics: a new tool for a new era', Educause Review, Vol. 42(4 July/August), pp.40–57.

Campbell, J.P. and Oblinger, D.G. (2007) Academic Analytics, Educause.

Conole G. (2013), MOOCs as disruptive technologies: strategies for enhancing the learner experience and quality of Moocs, RED - Revista de Educación a Distancia, 39.

De Santis A., Fazlagic B., Sannicandro K., Folloni V., Tedeschi C., Minerva T. (2017), From design guidelines to validation checklists: EduOpen MOOCs, Design the Future! Multiconferenza EM&M ITALIA 2016, Modena, pp. 264-275.

Limone P., Pace R., De Santis A. (2016), Guidelines for the design of MOOC courses: the experience of the University of Foggia, in M. Rui, L. Messina, & T. Minerva (eds), Teach different! Proceedings of the EMEMITALIA2015 Multiconference. 495-498. Genova, Genova University Press.

Long, P. and Siemens, G. (2011) 'Penetrating the fog: analytics in learning and education', EDUCAUSE Review, Vol. 46, No. 5, pp.31–40.

Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C., et al. (2011) Big Data: The Next Frontier for Innovation, Competition and Productivity, McKinsey Global Institute, May.

Mazza, R. and Milani, C. (2004) 'GISMO: a graphical interactive student monitoring tool for course management systems', paper presented at The T.E.L.'04 Technology Enhanced Learning'04 International Conference, Milan, Italy (18–19 November).

Romero, C., Ventura, S. and García, E. (2008) 'Data mining in course management systems: moodle case study and tutorial', Computers & Education, Vol. 51, No. 1, pp.368–384.

Siemens, G. (2010) What Are Learning Analytics? Available online at: http://www.elearnspace.org/blog/2010/08/25/what-are-learning-analytics/ (accessed on 24 September 2010).

Swan K., Day S., Bogle L., Van Prooyen T., (2014), AMP: a tool for characterizing the pedagogical approaches of MOOCs, e-mentor, 2(54), 75-85.