A research agenda on MOOCS: the perspective of social sciences

Una agenda di ricerca sui MOOCS: la prospettiva delle scienze sociali

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ABSTRACT Originated to help academic institutions innovate pedagogical models, MOOCs are taking different routes, some of them marked by public policies, others by market strategies. Questioning the MOOC phenomenon according only to pedagogies and learning theories means, however, underestimating their impact on the evolution of educational systems. This article intends to define a research agenda into the social impact of MOOCs, in order to reflect on changes in educational policies, on academic culture, and on learning measurement. For this reason we suggest focusing attention on three features of MOOC phenomenology: MOOCs as a social movement - an active policy initiative to promote greater democratization of education; MOOCs as a medium and a cultural artifact (mediated texts, videos, interface, platform functionalities) able to convey learning to distant learners; and, lastly, MOOCs as a measurement - in other words as instrumentation (i.e. learning statements, analytics, algorithms, visualizion tools, dashboards etc.) that allow you to monitor, analyze and optimize the effectiveness of online teaching and learning. We also highlight their limits in these regards.

KEY-WORDS MOOC; Educational policy; Measurement; Academic culture.

SOMMARIO Creati per aiutare le università ad innovare i propri modelli pedagogici, i MOOC stanno prendendo diverse strade, in alcuni casi per intervento delle politiche pubbliche, in altri come risultato delle strategie di mercato. Interrogare il fenomeno MOOC solo dalla prospettiva pedagogica e delle teorie dell'apprendimento comporta tuttavia sottostimare l'impatto dei MOOCs sull'evoluzione dei sistemi educativi. Questo articolo intende proporre una agenda di ricerca sull'impatto sociale dei MOOC per riflettere sui cambiamenti che stanno avvenendo nelle politiche educative, nella cultura accademica e negli strumenti di misurazione dell'apprendimento. Per questa ragione suggeriamo di focalizzare l'attenzione su tre caratteristiche della fenomenologia MOOC: MOOC come movimento sociale, cioè come politica attiva di richiesta di maggiore democratizzazione dell'educazione, MOOC come media vale a dire come artefatto culturale, interfaccia e piattaforma che veicola l'apprendimento e, infine, MOOC come misurazione, come strumentazione (es. dichiarazioni di apprendimento, dati, algoritmi, tool di visualizzazione, cruscotto dati) che consente di monitorare, analizzare e ottimizzare l'efficacia dell'insegnamento e dell'apprendimento online mettendone in evidenza anche i limiti.

PAROLE CHIAVE MOOC; Politiche educative; Misurazione; Cultura accademica.

1. THE MOOC SCENARIO

Teaching in the digital era is characterized by a predominance of complexity. The development and deployment of educational software systems and platforms has dramatically changed the process of education delivery. Different media and online platforms are increasingly being seen as important contributors to teaching and learning, and this trend is likely to continue into the future (Siemens, Gasevic & Dawson, 2015). Siemens states, in fact, that "much of today's economy is knowledge-based and, in a knowledge economy, we need to be learning constantly" (Siemens, 2013, p. 1). As a consequence, the Internet has contributed by creating a *parallel system of education* where learners learn on their own and through social networks (Siemens, 2013; De Rosa, 2017).

MOOCs are described as a challenge to the dominant view of teaching and learning (Selwyin & Bulfin, 2014), but what MOOC stands for is still not always clear. Coined in 2008 by D. Cormier (Downes, 2008) to describe the course that G. Siemens and S. Downes ran at Athabasca University on *Connectivism and Connective Knowledge*, many diverse definitions have been discussed in the literature focusing on scale, pedagogies and targets. For Educause (2012) «*MOOCs are online courses where lectures are typically "canned" quizzes and testing are automated, and student participation is voluntary. They attain large scale by reducing instructor contact with individual students; students often rely on self-organized study and discussion groups*» (2012, I). Pappano (2012) stated that MOOCs are a new way of delivering open access, online courses that can be scaled up to reach potentially limitless numbers of users, crossing geographical confines to offer quality learning content to the global market.

Educause (2012) also highlighted significant issues associated with the emerging field: its potential to scale up education; the uncertain business and return on investment (ROI) models; the low innovation approach used by many MOOC providers (Porter, 2015; Ubel, 2017); the use of MOOCs as brand extension, and finally the catalyzing force towards new credentialing approaches. After years of discussion around MOOC pedagogies and paradigms, the concept is about to change again. The massiveness and openness ideas are loosing their centrality in the public debate, while pressure for sustainability and for quality of learning design and pedagogy increases.

In 2012, with the development of bespoke MOOC platforms, the phenomenon gained momentum (Daniel, 2012; Koller & Ng 2012; Brooks, 2012; Bull, 2012; McKenna, 2012) and reached new heights (Coates, 2013; Yang, 2013; Porter, 2015; Dillenbourg, 2013; Horn & Christensen, 2013). In Europe, expectations were accompanied by a certain apprehension regarding the future of public universities, and competition among old and new players (Fundación Telefónica, 2013).

In fact, the MOOC market is experiencing dramatic growth. A report from Class Central (Dhawal, 2015; 2016) showed that not only is the number of MOOCs increasing, but so is the number of students who enroll in open courses. In the year 2015, there was a global offer of over 4000 courses; in 2016 the global offer was about 6,850 MOOCs from over 700 universities. The number of students has doubled from 16-18 million to 35 million in 2015. In 2016, the number of students enrolled in at least one MOOC reached 58 million, and 23 million students enrolled for the first time in a MOOC. However, several surveys of MOOC users agree that the most typical course participant is a male with a bachelor's degree who is 26 or older (Ho et al., 2014). In a survey of 400,000 users in 2015 by the University of Pennsylvania, the number of MOOC users with a degree reached 83%; most are employed and living in industrialized countries (Wildavsky, 2015). These data clearly demonstrate that there is a high demand for education that is not being met by the education system as it stands. Moreover, they also demonstrate that already privileged people are taking advantage of this free educational offer, thus opening the door to criticism about the capacity of online education to reduce inequalities and to provide access to education for all. The United States are still leading the trend, with *Coursera* and *edX* providing over 50% of the global offer, while in Europe providers such

as *FutureLearn* and *FUN* are leading the European MOOC offer; a further contribution in fostering MOOC development is coming from new regional platforms. The Arabic-language platform, *Edraak*, backed by the Queen Rania Foundation of Jordan is approaching 1 million users, India launched its official MOOC platform, *Swayam*, with 6 million users, while the Chinese *XuetangX* is the only non-English MOOC platform in the top five, reaching 6 million users in 2016 (Marsh, 2017).

In Europe, survey studies have highlighted a complex situation, with some areas much more active than others but also a wide range of key players (public, private, non-profit), some of whom have different objectives and business models (De Rosa & Reda, 2013). A comprehensive study of the European scenario has been conducted by the European Universities Association to gain a better understanding of the strategic reasons why a higher education institution is or isn't involved in MOOCs (Gaebel, Kupriyanova, Morais, & Colucci, 2014), and to compare these reasons with the results of similar studies in United States (Allen & Seaman, 2014; 2015). The survey demonstrated that more institutions in Europe than in the United States plan to increase their MOOC offer in the near future. Opportunities for pedagogical experimentation and branding are primary objectives for the European Union, whereas objectives related to finance or scalability are of less importance. On the opposite side, United States institutions aim to boost student recruitment.

With this tendency towards growth and increasing interest, the delivery mode and access to education is definitely going to shape and change the educational landscape at many levels. Porter (2015) believes that we cannot be sure about the quality or the quantity of disruption that MOOCs are going to bring (Christensen, Johnson, & Horn, 2008), but educational institutions need to experiment with them and to assess the impact on their internal operation.

2. A MOOC PHENOMENOLOGY: PURPOSE FOR A RESEARCH AGENDA

Three key areas have emerged from the public debate so far (De Rosa & Reda, 2013).

The first one concerns the kind of vision, ideology, theoretical definition or perspective that pushes policy makers towards specific choices. We can distinguish here at least three emerging paradigms:

- the 'economic paradigm' considers openness as a means of freeing up the education market and removing some of the traditional barriers hindering access to education by unbundling it, creating business opportunities for new players, and enabling established players to find a response to government cuts in education funding. In this context, the transnational dimension of MOOCs deserves great attention. Branding and marketing become key factors as these define the channel power of MOOC platforms such as Coursera, Edx, Udacity;
- for the 'democratic paradigm', openness is interpreted as a way of democratizing access to higher education, and of wielding cultural soft power in parts of the world where there is less protection for human rights (Agarwal, 2013);
- finally, the 'European paradigm' considers openness as a call to action to provide an adequate response to an education activism which seems to be dominated by the USA, and to safeguard cultural and linguistic diversity. This scenario seems to hinge on the adoption of protectionist policies (De Rosa & Reda, 2013).

The second key area – that of 'instructional design' – regards the need to design new learning models that reflect the context students live in and their cultural background, the way digital natives use cultural products, and the instructional design underlying the development of platforms. A growing amount of literature now exists that deals with differences between MOOC formats (cMOOC, xMOOC, iMOOC, hMOOC), and the advantages of one particular model over another (Siemens, Gaševic, Dawson, 2015; Ross et al., 2014; De Rosa & Reda, 2013). The question of quality is often raised in defence of the academic tradition. But if over 58 million people have enrolled in a MOOC so far, it means that the MOOC format is somehow

responding to specific needs in a public of education seekers.

'Ethical issues' is the last key area emerging from the public debate and includes the academic duties of care and integrity, but also the potential commercial exploitation of learners. Using the words of Marshall (2014), ethics in the MOOC environment is at least twofold, deontological and teleological. The collection of massive data regarding MOOC users in a market which is basically unregulated could prove to be a lucrative sector for profiling agencies, and could threaten individual and privacy rights. Existing privacy protection mechanisms include anonymization of data and consent (in this case it makes data collection hard), which may not be enough, especially when it's not completely clear or well defined who the data belong to: participants, institutions, or platforms (Jones & Regner, 2016). On the teleological level, instead, "we have a professional and social obligation to ensure that we are not abusing a position of trust and responsibility and acting, irrespectively of our wider goals and intentions, in an unethical manner" (Marshall, 2014, p. 2).

Taking this background into consideration, this article intends to define a research agenda on the impact of the MOOC movement on education policy, on academic culture, and on learning assessment, to underline the distance between existing practices and public discourse. A key part of the agenda recognizes the relevance that social movements play in advancing educational reform. As suggested by Rhoads, «*MOOCs constitute a unique and somewhat independent force having significant implications for society and how we think about higher learning*» (Rhoads, 2015, p.9).

This article also intends to involve scholars from social sciences in a debate that has been largely ignored, since the topic of the changing educational environment as a result of MOOCs has been largely considered in terms of delivery models or learning patterns, or at best, learner demographics, and so has interested pedagogists and educational sociologists (Raffaghelli, Cucchiara, & Persico, 2015). It could also be useful to analyse the MOOC phenomenon by focusing on emerging policy frameworks and changing power relationships between old and new actors. While, on the other hand, media scholars could use their lens to look at mediated educational processes, exploring whether the inherent logic of action is affected by the different media used. The objective is to assess the transformative power of MOOCs in education.

Premises for such an agenda consider that

a. the MOOC-led evolution of education is a sort of social movement where institutional strategies are somehow connected to and inspired by cultural change;
b. MOOC providers and their platforms profess a non-neutral role in legitimating discourses around pedagogies and policies in education and, finally,
c. the power of influence exterted by automated data (algorithms and learning analytics) is becoming so pervasive that many scholars are beginning to raise serious concerns (Williamson, 2014; Landri, 2018).

The following sections describe three research lines on which the academic community is called to reflect.

2.1 *The MOOC social movement: institutional strategies and policy reforms*

The MOOC movement originated as part of the broader Open Education movement, which, in turn, has its roots in public libraries and pressure to provide open access to scientific publications (Calise & De Rosa, 2010). These are all offshoots of the more famous open source movement, which originated in the eighties under the leading action of Richard Stallman to free up access to new software source codes. As stated by the Cape Town Open Education Declaration signed in 2007 by the Shuttleworth Foundation and the Open Society Institute, «*this emerging open education movement combines the established tradition of sharing good ideas with fellow educators and the collaborative, interactive culture of the Internet*». A slow process, therefore, spanning a few decades, that has developed in different directions, that has experienced sometimes bitter conflict, but has managed to take advantage of various opportunities - political and economic - to gain a legit-

imate place in public debate. We should take this complex legacy into account when trying to reconstruct the kind of ideological paradigm or ideas that have inspired the MOOC phenomenon. However, since there are copious amounts of well-known literature on the subject of openness (Willinsky, 2005), we could limit our focus to take the launch of the OpenCourseWare Project at MIT in 2002 as the official start date of the Open Education movement, where 'openness' does not only mean accessible - as it does for the open universities - but also 'free' to use and reuse. Such a statement has been formalized by the Cape Town Open Education Declaration with the «*aim* […] *to accelerate efforts to promote open resources, technology and teaching practices in education*» (Open Society Foundation 2007, p.1).

But how do players, resources (organisational and ideological), structures of economic and political opportunities interact (Tarrow, 1994) and encourage the emergence of instances of change in the higher education sector? Answers to these questions can be gained by reconstructing the legacy of the MOOC movement, which implies its recognition as an evolution of the openness paradigm into the field of education, and an analysis of its political role in breaking traditional settings. In other terms, understanding how the MOOC phenomenon is perceived by key players in the field means not only analysing what their aims, strategies and expectations are but also considering the actors as more or less powerful players within a complex system of preferences and shares in order to promote their vision of the world or to gain position in the system. This is a complex scenario which still lacks cohesion but whose reconstruction will clarify the impact that changes are having on institutions and on academic culture at large. Policy framework analysis lends itself to this type of research because it enables researchers to explore a new context through procedural analysis . This approach is designed to explore and describe the initial stages of a phenomenon in order to understand what is happening in a particular setting (Ritchie & Spencer, 1994). More specifically, the behavior of at least three players has to be observed: the Open Universities, who, by way of tradition, approach and business model were amongst the first to take advantage of the opportunity for online teaching, since their MOOC position is simply an evolution of what they already did as their institutional brief (i.e. the English MOOC platform: FutureLearn); professional networks and think-tanks, who play a significant role in informing/influencing decision-making processes at national and European level; public universities playing a new role in an old terrain, and others who are more sceptical about the teaching at scale that new technologies allow for.

Where all of the above are concerned, as well as the other cases that will probably emerge over time, it is important to understand how these players will face up to the new opportunities and threats posed by the Open Education movement as it goes global and in what way they intend to respond to that evolution. At this stage, two models seem to be emerging. One is the schooling as platform approach, which identifies online teaching as an extra effort – and an opportunity - to reflect on the changing world of learners and learning. This world seems widely affected by the so-called uberization of teaching, a concept used to identify what happens when a specific student – autonomously - seeks out a specific teacher or group of teachers to learn a specialized skill or skill set (Rogers, 2014) and, vice versa, when a teacher or a specific group of teachers offer their knowledge on the market, outside institutional or formalized arrangements.

On the opposite side, the platform as brand extension approach intends to position educational institutions on the global market of education by exploiting the channel capability of a few relevant MOOC aggregators to reach new audiences and by accepting unification of their pedagogical approaches in a pre-established format. Both models represent a challenge for which outcomes are uncertain.

This research line should be able to cover different layers, concerning both policy design and its implementation (see Figure 1). Multiple-approaches based research should be put in place to cope with a research issue that is multi-faceted in nature (Kerr & Eradze, 2016).

In other words, it implies the analysis of:

- the role of private as well as public key players/stakeholders in the field and/or in relation to the MOOC movement at a European, international as well as national level (who);
- the policy framework, values and paradigms which they are inspired by (why);
- the strategies, policies and goals they enact to react to/sustain the change that the virtualisation of teaching implies (how);
- the changing habits of education targets in the digital era and their demand for highly personalised learning paths and new rights (to whom);
- the impact that MOOCs are expected to have on organisational settings and academic culture in general, on institutional performances, and market assets (impact);
- the effects in terms, for example, of legitimation processes (for new agency, actors, pedagogies etc.) and the side-effects in terms of mediatisation vs disintermediatisation of education from their traditional agencies, i.e. the uberization of education, the starization of teachers (effects).

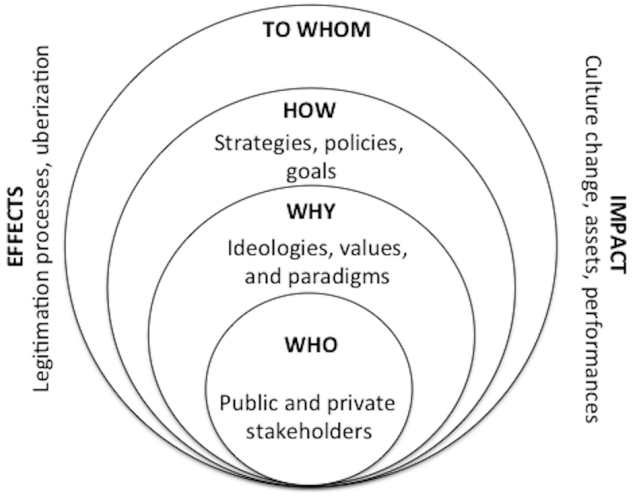

Figure 1. Model for a MOOC Policy Framework Analysis.

2.2. *The media role of MOOCs and their legitimating discourses*

MOOC platforms have been introduced - and supported - by legitimating discourses aimed at emphasizing their disruptive role in a highly formalized system and their positive impact on the education system. Since the Internet is democratizing access to the global marketplace for millions of people around the world, online platforms play a crucial role in fostering the global growth of society.

If the first research line was about policy design, the second one involves more directly the 'software space' represented by MOOC platforms, in other words the space which is reserved to platforms in the public discourse. Many people are already familiar with the American MOOCs initiatives - like Coursera, edX, Udacity etc. – but they fail to realise how hard these initiatives work to maintain their position in a market that is currently worth 0.9 billion dollars and is expected to grow to 14.2 billion dollars by 2020 (Visiongain, 2015). These initiatives compete with each other in the global education market either to safeguard their position or to explore specific market segments that are created in the gaps between public and private,

online and offline. In this situation, whether opening up education is to be seen as a dream or a nightmare depends on how much - and for how long - MOOCs are considered cultural/commercial products and/or processes really needed by society as a whole. The variable time is, in this respect, a crucial one to understand if and how MOOC initiatives create new opportunities or new inequalities.

Adopting a cultural studies approach, Murray (2015, p.1) reflects on the fact that although histories of technology remind us that flux moments are always accompanied by "the discursive polarities of utopia and dystopia", the future is a high stakes game. «*For some, the MOOC's maximum visibility means that the democratization of education is within reach. For others, MOOCs undermine the deeply rooted epistemologies of the traditional university and force higher education administrators to address outdated teaching models. Still for others, the MOOC reflects disordered priorities that ignore inequality*» (Murray, 2015, p. 1).

Thinking of the MOOC as a medium and a mediated text (Couldry & Hepp, 2016), we could approach the argument from a new perspective to question variables which have been largely ignored so far. Assuming Murray's perspective, this research line focuses on the legitimating discourses of the MOOC and on the role of transactional pedagogies (what is being offered to the enrollee, how is the everyday reception of the MOOC, and how this reception is affected by the structure, content and presentation of the MOOC). According to Science and Technology Studies (STS), the MOOC can also be conceived as a medium and the MOOC platform as a 'cultural artifact', a material expression of ways to conceive education, teaching, and learning in a specific time-space constraint. In that respect, it becomes relevant to understand what technological affordances facilitate achievement of learning objectives, and how technological constraints or facilitations become inscribed in the instructional design changing the model, symbols and meaning of teaching reception: in other words, how learning becomes a social construction mediated by material artifacts and their processes of sense-making. Finally, another crucial question concerns how communities of interest alter the structure of a MOOC, considered not only as content to be delivered but as a focal point in a complex network of multi-level and multi-cultural relationships. A promising unit of analysis is, for example, the emergence of 'hybrid actors': the 'video-recorded teacher' is, in fact, a socio-material construction that implies a complex assemblage of human-nonhuman relationships. The video-recorded teacher represents an interesting lens to address the question of the transformation of the academic pedagogical device (Perrotta, Czerniewiczb, & Beethamc, 2015).

Imported from ethnography and communication studies, research tools, methodologies and paradigms may produce in-depth descriptions of both production and consumption processes of MOOCs as medium and as cultural artifacts - artifacts that depend on a complex network of variables concerning public discourses, legitimation and mediation processes.

2.3. *MOOC as measurements: the hidden power of analytics*

Algorithms, as part of code that intervenes in decision-making (Kitchin, 2014), play a central role in the education field. The MOOC explosion in Europe led to the emergence of a series of issues relating to assessment in the online environment. It implies, in fact, a complete reconsideration of the level of accountability offered at different levels: institutional performances as well as teaching methods are now under the lens of observation, both for financial and pedagogical reasons. The concept of MOOCs offers the potential to reshape policies in the education field, attributing to data a guidance role in tracing the road towards the learning society (Vuorikari & Castaño Muñoz, 2018).

In searching for an successful evidence-based strategy, a large amount of data is produced through platforms, gaining in significance and expectations. Learning analytics are going to play a political role in fostering innovation and/or testifying to its (in)adequacy. Learning Analytics is defined as the «*measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding*

and optimizing learning and the environments in which it occurs» (SoLAR, 2011, p. 1). Systems for tracking learner activity online, and analysis of various types of data (logs, learning analytics, quizzes etc.) are gaining in popularity as a way of giving face-validity to assessment of learning outcomes. They imply an almost direct correlation between the way an e-learning platform is used, the success of the learning experience, and the political and social approval of financial investment in digital learning.

The last dimension of analysis is then the role that learning analytics may play in educational policy. The decisions, assumptions and interests reflected in the algorithms behind educational platforms may have – in fact - significant consequences on education systems in terms of learning experience offer, political use of analytics, as well as in terms of access, privacy, and cultural diversity. Yet understanding of these processes is still at an initial stage. In this respect, the European Commission is making many efforts to foster research and practice in the field through, for example, EU-funded projects devoted to testing the impact of learning analytics technology on business models, and encouraging the exchange of best practices for learning analytics and adaptive learning technologies.

Learning analytics is now emerging as a research field in its own right, experiencing a gradual shift from technology and education towards a societal focus (Ferguson, 2012), putting on the table both the issue of *governing education through data* (Williamson, 2015) and *governing data through education* (Aragona & De Rosa, 2018). The main problem with learning analytics is that the field is still missing a critical understanding of the implications that a deep use of analytics may have at a personal, institutional and societal level, although ethnographic studies seems to be on the front line in seizing the challenge (Nistor et al., 2015; Ferguson, 2014). Criticisms are also raised about data sources' heterogeneity, design patterns, quality data standards (Chatti et al., 2015) and, more in general, about the complex relationship between learning outcomes and the process of learning (Ferguson & Dough, 2017): understanding that has been the early premise and the promise of learning technologies (Pardo et al., 2014).

From the Social Sciences perspective, these criticisms are still partial because they do not affect the layer of the pressure toward conformity expressed by dataveillance and by the global power of macro and microstructure (Knorr Cetina, 2002). This is what happens, for example, in the field of communication when Couldry and Hepp (2016) in *The Mediated Construction of Reality* question the concept and practice of 'social order' in the era of datafication. In an era of deep mediatization, where every element of social process and social life is composed of elements that have already been mediated, the authors emphasize the conflicts that exist today between our material systems of interdependence (particularly those focused on information technology and data processing systems) and normative principles such as freedom, autonomy and choice. Warnings about these aspects were raised many years before the advent of MOOCs by Roger Clarke, who described the digital persona «*as a model of the individual established through the collection, storage and analysis of data about that person*» (1993, pp. 77): an economically efficient means of exercising control over the behaviour of individuals and societies.

It is necessary, at this point, to figure out what the pros and cons of learning analytics are, and how the use of learning analytics and big data can impact on individual as well as social expectations. For this purpose, case studies should be collected all around the world focusing on such initiatives where learning analytics constitute a specific asset to deploy, as is the case for the Predictive Analytics Reporting Framework (PAR) (De Rosa, 2017).

More in general, different levels of analytics combine to form a set of data that can provide useful pointers for making instructional design more effective, but whether they can really give clear indications for policy setting depends on theoretical framework, data gathered, statements and algorithms. The discourse is different where the social and psychological impact of learning analytics at an individual and community level is concerned: it implies a dimension of social control with a level of efficiency that has never been

experienced before. This has serious implications for people's choices, as happens with the *hidden curriculum effect*, when indications on student performance can influence institutional, familiar, and personal choices or can reproduce social inequalities (Freire, 1970). Researchers should try to understand to what extent learning analytics are rooted in academic institutions, for what purposes they are collected and used (even outside the educational context), what are the expectations and implications raised by the field and – moreover – how to create a genuine and extended data culture (Aragona & De Rosa, 2018).

3. CONCLUSIONS

Due to the profound implications that educational change is going to have on 21st century learning, the definition of new policy settings that are able to anticipate, organize and realign educational needs with individual rights is becoming urgent (De Rosa, 2017). Research can play a fundamental role by addressing and informing policymakers in a sensitive field that can affect the future of generations of people as well as their quality of life in a fast changing society. In this respect, questioning the MOOC phenomenon according only to pedagogies and learning theories means underestimating it. This is the reason why we suggest focussing attention on three features of MOOC phenomenology as it manifests itself: the MOOC as social movement, as medium, and as measurement.

MOOC *as movement* is a social pressure towards clear directions: with online learning, the idea of tomorrow's education, where any educational need is satisfied at a distance for all, in real time, and on demand is already there. But the time has arrived to reflect on the road that the MOOC experience has taken us down so far: for example, what will be the destiny of education in the artificial intelligence era, when AI applications supported by big data and analytics could decide the type and quality of investment deserved by each individual? The MOOC experience at Edx demonstrated that teachers can be replaced by good actors able to talk on video in a more appealing way. In the future, are we really sure that teaching will not be replaced by robots (Tynan, 2017)?

MOOC *as medium* implies a transformative power of technology over culture [and vice versa?], where transactional pedagogies (Williamson, 2014) and system unbundling will contribute to redefine roles, functions, and power relationships between old and new actors, raising lots of ethical issues.

Finally, MOOC *as measurements* is a decisive step towards quantified education, as is expressed by learning, institutional and academics analytics through their "ranking of everything" procedures. Here the power of algorithms, the quality of teaching, and learner performances may represent a unique entry point for a new and sneakier system of inequalities. Because, to some extent, «*the MOOC phenomenon redefines what is meant by 'learning', 'teaching', and 'assessment' and at the same time blurs the boundaries between them*» (Levy 2014, p. 106).

Transversally, the three dimensions are crossed by the teleological destination of education, which seems to depend even more on the will and the force of academic communities to defend the degrees of liberty that some disciplines – such as those in the humanities - have gained so far. To preserve the humanistic knowledge territory from reductionist attempts operated by the market, these communities have to counteract that policy framework which - at a certain point - could become mainstream in MOOC evolution, so playing a decisive political role.

By widening the disciplinary horizons around the MOOC phenomenon, this research agenda offers the opportunity to identify emerging issues at the macro, meso and micro level. At the *macro level*, by observing how the phenomenon evolves and what is the impact exercised by both the market and public institutions, the research agenda could estimate the real disruptive potential of the MOOC phenomenon, highlighting those turning points in which a strategy stops being disruptive and becomes only aggressive. At the *meso level*, by

understanding how MOOC initiatives intend to cope with cultural diversity, how the pressure to scale will be harmonized with different pedagogies, languages and personalization requests, the agenda will help to address implications at a deeper level where identities and differences are concerned. Finally, at the *micro level*, by conceiving privacy and civil rights as a politically sensitive territory, this research agenda could represent an enforcement of the rule of law where evidence based analysis is concerned.

4. REFERENCES

Agarwal, A. (2013, June 15). Online Universities: it's time for teachers to join the revolution. *The Guardian*. Retrieved from https://www.theguardian.com/education/2013/jun/15/university-education-online-mooc

Allen, I. E. & Seaman, J. (2015). Grade Change: Tracking Online Education in the United States. *Babson Survey Research Group and Quahog Research Group*. Retrieved from onlinelearningsurvey.com

Aragona, B., & De Rosa, R. (2018). Policy making at the time of big data. Datascape, datasphere, data culture. *AIS Journal of Sociology*, *11* (April), 173-187. doi: 10.1485/AIS_2018/11_3434226

Brooks, D. (2012, May 3). The Campus Tsunami. *The New York Times*. Retrieved from https://www.nytimes.com/2012/05/04/opinion/brooks-the-campus-tsunami.html

Bull, D. (2013). From Ripple to Tsunami: The Possible Impact of MOOCs on Higher Education. *DEQuarterly, 201*(12), 10-11.

Open Society Foundation (2007). *Cape Town Open Education Declaration*. Retrieved from http://www.capetowndeclaration.org/read-the-declaration

Calise, M., De Rosa, R., & Marín, X. (2010). Electronic Publishing, Knowledge Sharing and Open Access: A New Environment for Political Science. *European Political Science*, 9 (Suppl 1), 50-60. doi: 10.1057/eps.2010.35

Chatti, M. A., Lukarov, V., Thüs, H., Muslim, A., Yousef, A. M. F., Wahid, … Schroeder, U. (2014). Learning Analytics: Challenges and Future Research Directions. *Eleed*, 10. Retrieved from https://eleed.campussource.de/archive/10/4035/

Christensen, C. M., Horn, M. B., & Johnson, C. W. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. New York, NY: McGraw-Hill.

Clarke, R. (1994). The digital persona and its application to data Surveillance. *The Information Society*, *10*, 77-92. doi: 10.1080/01972243.1994.9960160

Coates K. (2013). The re-invention of the academy: how technologically mediated learning will – and will not – transform advanced education. In S.K.S. Cheung, J. Fong, W. Fong, F.L. Wang, L.F Kwok (eds), *Hybrid Learning and Continuing Education,* (1-9). ICHL 2013. Lecture Notes in Computer Science, vol. 8038. Berlin, Heidelberg, DE: Springer.

Couldry, N., & Hepp, A. (2016). *The Mediated Construction of Reality.* New York, NY: Polity Press.

Daniel, J. (2012). Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility. *Journal of Interactive Media in Education*, *3*. doi: 10.5334/2012-18

De Rosa, R. (2017). Governing by data: some considerations on the role of analytics in education. In C. Lauro, E. Amaturo, B. Aragona et al. (Eds.), *Data Science and Social Research - Epistemology, Methods, Technology and Applications* (pp 67-77). Cham, CH: Springer International.

De Rosa, R., & Bogliolo, A. (2016). Changing Mindset in School teachers. The Strange Case of the Italian national Plan for Digital School and the h-Mooc on Coding. In *Edulearn16 proceedings* (pp. 4191-4199). Valencia, SP: IATED publisher. doi: 10.21125/edulearn.2016

De Rosa, R., & Reda, V. (2013). La rivoluzione dei MOOCs: un'analisi di policy framework su scala europea. *LEA*, 2, 594-631. doi: 10.13128/LEA-1824-484x-13850

Dhawal, S. (2015). By The Numbers, MOOCs in 2015. *Class Central Report* 2015. Retrieved from https://www.class-central.com/

Dhawal, S. (2016). By The Numbers, MOOCs in 2016. *Class Central Report 2016*. Retrieved from https://www.class-central.com/

Dillenbourg, P. (2013). *MOOCs in Europe: An overview*. Presentation at eMOOCS European Stakeholder Summit, Lausanne 2013.
Retrieved from http://www.aca-secretariat.be/fileadmin/aca_docs/images/members/Karl_Aberer.pdf

Downes, S. (2008). Places to Go: Connectivism & Connective Knowledge. *Innovate: Journal of Online Education*, *5* (1), Article 6. Retrieved from http://nsuworks.nova.edu/innovate/vol5/iss1/6

Educause (2012). What campus leaders need to know about MOOCs. *An EDUCAUSE Executive Briefing*. Retrieved from https://library.educause.edu/resources/2012/12/what-campus-leaders-need-to-know-about-moocs

Ferguson, R. (2012). The state of learning analytics in 2012: A review and future challenges. *Knowledge Media Institute, Technical Report,* KMI-2012, 1.

Ferguson, R. (2014). Setting Learning Analytics in Context: Overcoming the Barriers to Large Scale Adoption. *Journal of Learning Analytics*, *1*(3), 120–144.

Ferguson, R., & Clow, D. (2017). Where is the evidence? A call to action for learning analytics. In *LAK '17 Proceedings of the Seventh International Learning Analytics & Knowledge Conference*, ACM International Conference Proceeding Series, 56–65.

Freire, P. (1970). *Pedagogy of the oppressed*. New York, NY: Herder and Herder.

Fundación Telefónica (2015). *MOOCs in the Education of the Future: Digitizing Training.* Fundación Telefónica, 03 February 2015.

Gaebel, M., Kupriyanova, V.A, Morais, R., & Colucci, E.H. (2014). *E-learning in European Higher Education Institutions: Results of a mapping survey conducted in October-December 2013*. Retreived from http://www.eua.be/Libraries/publication/e-learning_survey

Ho, A. D., Reich, J., Nesterko, S., Seaton, D. T., Mullaney, T., Waldo, J., & Chuang, I. (2014). *HarvardX and MITx: The first year of open online courses.* HarvardX and MITx Working Paper No. 1.
doi: 10.2139/ssrn.2381263

Horn, M., & Christensen, C. (2013). Beyond the Buzz, Where Are MOOCs Really Going?. *Wired.com*, 20 February 2013.

Jansen, D. & Konings, L. (2017). *MOOC Strategies of European Institutions. Status report based on a mapping survey conducted in November 2016 – February 2017*. EADTU.
Retrieved from http://eadtu.eu/

Jones, M. L., & Regner, L. (2016). Users or Students? Privacy in University MOOCs. *Science and Engineering Ethics,* 22,1473-1496.

Kerr, R., & Eradze, M. (2016). I MOOC: un fenomeno multi-dimensionale. *Italian Journal of Educational Technology (formerly TD Tecnologie Didattiche)*, *24*(2), 126-129.

Kitchin, R. (2014). *The data revolution: Big data, open data, data infrastructures & their consequences*. London, UK: Sage.

Knorr Cetina, K. (2002). Global Microstructures: The Virtual Societies of Financial Markets. *American Journal of Sociology*, *107*(4), 905-950. doi: 10.1086/341045

Koller, D., & Ng, A. (2012, November 8). Moocs: the Coming Revolutions? *Educause Seminar* [Video].

Landri, P. (2018). *Digital Governance of Education*. London, UK: Bloomsbury Publishing.

Levy, D. (2014). Two Types of MOOCs: An Overview. *Adult Education in Israel*, *13*, 106-117.

Marsh, N. (2017, January 4). MOOC users reach 58 million globally. *The Pie News*.
Retrieved from: https://thepienews.com/news/edu-tech/mooc-users-reach-58-million-globally

Marshall, S. (2014). Exploring the ethical implications of MOOCs. *Distance Education*, *35*(2), 250-262. doi: 10.1080/01587919.2014.917706

McKenna, L. (2012, May 11). The Big Idea That Can Revolutionize Higher Education: 'MOOC'. *The Atlantic*. Retrieved from https://www.theatlantic.com/business/archive/2012/05/the-big-idea-that-can-revolutionize-higher-education-mooc/256926/

Murray, S. (2013, March 11). What is the Media & Cultural Studies of the MOOC?. *Antenna*. Retrieved from http://blog.commarts.wisc.edu/2013/03/11/mooc/

Nistor, N., Derntl, M., & Klamma, R. (2015) Learning Analytics: Trends and Issues of the Empirical Research of the Years 2011–2014. In G. Conole, T. Klobučar, C. Rensing, J. Konert, & E. Lavoué (Eds.), *Design for Teaching and Learning in a Networked World. Lecture Notes in Computer Science* Vol. 9307 (pp 453-459). Cham, CH: Springer International.

Pappano, L. (2012, November 2). The Year of the MOOC. *The New York Times*.
Retrieved from: http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html

Pardo, A., & Teasley, S. (2014). Learning analytics research. Theory and practice: widening the discipline. *Journal of Learning Analytics*, *1*(3), 4-6.

Perrotta, C., Czerniewicz, L., & Beetham, H. (2015). The rise of the video-recorder teacher: the sociomaterial construction of an educational actor. *British Journal of Sociology of Education*, *37*(8), 1251-1267. doi: 10.1080/01425692.2015.1044068

Porter, S. (2015). *To MOOC or Not to MOOC: How Can Online Learning Help to Build the Future of*

Higher Education?.Oxford, UK: Chandos Publishing.

Raffaghelli, J. E., Cucchiara, S., & Persico, D. (2015). Methodological approaches in MOOC research: Retracing the myth of Proteus. *British Journal of Educational Technology*, *46*(3), 488-509. doi: 10.1111/bjet.12279

Rhoads, R. A. (2015). *MOOCs, High Technology, and Higher Learning*. Baltimore, MD: JHU Press.

Ritchie, J. & Spencer, L. (1994). *Qualitative data analysis for applied policy research.* In A. Bryman & R. G. Burgess (Eds.), *Analyzing qualitative data* (pp.173-194). London, UK: Routledge.

Rogers, G. (2014). *The Uberization of Education*. Retrieved from https://www.linkedin.com/pulse/20140603135511-20348008-the-uberization-of-education/

Ross, J., Sinclair, C., Knox, J., Bayne, S., & Macleod, H. (2014). Teacher Experiences and Academic Identity: The Missing Components of MOOC Pedagogy. *MERLOT Journal of Online Learning and Teaching*, *10*(1), 57-69. Retrieved from http://jolt.merlot.org/vol10no1/ross_0314.pdf

SCORE2020. (2017). Needs analysis for support in Open Education and MOOCs. *Output 1 SCORE2020, EADTU.* Retrieved from http://score2020.eadtu.eu/

Selwyn, N., & Bulfin, S. (2014). The discursive construction of MOOCs as educational opportunity and educational threat. *MOOC Research Initiative* (MRI) - Final Report.

Siemens, G. (2013, July 8). Neoliberalism and MOOCs: Amplifying nonsens*e.* [Blog post]. *eLearnspace*. Retrieved from http://www.elearnspace.org/blog/2013/07/08/neoliberalism-and-moocs-amplifying-nonsense/

Siemens, G., Gašević, D., & Dawson, S. (2015). *Preparing for the digital university: A review of the history and current state of distance, blended, and online learning*. Athabasca, CA: Athabasca University. Retrieved from https://linkresearchlab.org/PreparingDigitalUniversity.pdf

SoLAR. (2011). Description of the 1st International Conference on Learning Analytics and Knowledge 2011. Athabasca, CA: Athabasca University. Retrieved from https://tekri.athabascau.ca/analytics/about

Tarrow, S. (1994). *Power in movement: Social movements, collective action and politics*. Cambridge, UK: Cambridge University Press.

Tynan, D. (2017, Feb 9). Actors, teachers, therapists – think your job is safe from artificial intelligence? Think again. *The Guardian*.
Retrieved from https://www.theguardian.com/technology/2017/feb/09/robots-taking-white-collar-jobs

Ubel, R. (2017, January 16). How the Pioneers of the MOOC Got It Wrong. *IEEE spectrum*. Retrieved from https://spectrum.ieee.org/tech-talk/at-work/education/how-the-pioneers-of-the-mooc-got-it-wrong /

Visiongain (2015). Massive Open Online Course (MOOC) Market 2015-2020: mEducation. *Distance Education, Open & e-Learning in Higher Education & Enterprise.* Retrieved from https://www.visiongain.com/Report/1382/Massive-Open-Online-Course-(MOOC)-Market-2015-2020

Vuorikari, R., & Castaño Muñoz, J. (Eds.). (2018). Research evidence on the use of learning analytics. Implications for educational policy. *JRC Science for policy report*, European Commission.
doi: 10.2791/955210

Wildawsky, B. (2015). MOOCs in the developing world: hope or hype?. *International High Education*, n. 80, Spring, 23-25. doi: 10.6017/ihe.2015.80.6154

Williamson, B. (2014). New governing experts in education: Self-learning software, policy labs and transactional pedagogies. In T. Fenwick., E. Mangez, & J. Ozga (Eds.), *World yearbook of education 2014: Governing knowledge*: *Comparison, knowledge-based technologies and expertise in the regulation of education* (pp.218–231). London, UK: Routledge.

Williamson, B. (2015, December 23). Digital Education Governance: An introduction. *European Educational Research Journal,* 3-13. Retrieved from doi: 10.1177/1474904115616630

Willinsky, J. (2005). *The Access Principle. The Case for Open Access to Research and Scholarship.* Boston, MA: MIT Press.

Yang, D. (2013, May 14). Are we MOOC'd out?. *Huffingtonpost.com*. Retrieved from https://www.huffingtonpost.com/dennis-yang/post_4496_b_2877799.html?guccounter=1