6 Certification

BizMOOC Discussion paper 6

Issues for MOOC recognition / certification / accreditation

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Issues for MOOC recognition/certification/accreditation

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1. Abstract

This paper aims at elaborating on the issues with regard to MOOCs' recognition, certification and accreditation and determines what should be considered in the nearest future to

use MOOCs as a bridge between formal and non-formal education.

MOOCs were not meant from the beginning to be part of the formal education, but as the time passes by, each time more students enrolled in this type or courses are requiring some kind of certificate. This is not an easy task, but seems to become a priority for a part of the students.

2. Introduction

Under the era of continuous and fulminant changes in information, communication and technology (ICT) field, the knowledge evolution implied numerous changes in the public and private sector, higher education not beeing an exception. There is no doubt on the need of increasing productivity and efficiency, and thus, efforts are undertaken in adapting the high potential of ICT.
The education system is experiencing gradual but constant changes given the new possibilities derived from the generation of open resources at international level (Bell, 2010). MOOCs appeared as a solution of the low or even lack of adaptation of higher education to the challenges of the society of today especially given the effects of the economic crisis on the employability. Therefore, gradual transformation took place from eLearning to OpenCourseWare. Given the dynamic evolution of knowledge and ICT, MOOCs could be the new education methodology allowing the rapid adaptation of curricula and contents to the new and changing requirements.

MOOCs can improve the effectiveness of education and innovation in learning that would provide broader access to knowledge. They can make lifelong learning a reality helping learners to up-skill and re-skill regardless of their socio-economic situation (Vassiliou, 2013). More socially inclusive and open for new learning and teaching methods, they can be increasingly useful if widely recognised, which however is burdened due to mainly two reasons – quality and financial

resources. In other words, the combination of digital content and global connectivism is enabling the perfect scenario for the introduction of new changes in higher education. Furthermore, and following Weller and Anderson (2013), the consolidation of new methodologies in the education system depends on the capacity to avoid the re4sistance to change and the support of the institutional ability to adapt and understand new challenges in the education field.

Since its inception in 2008, MOOCs have experienced a rapid growth in interest at the time that the need to address issues of learner assessment and accreditation was also increasing (McGreal et al., 2014). The fact that digital learning (with content obtained via Internet) enabling knowledge and skills acquisition via formal or informal learning, alone or in groups, does not implies that learners will achieve the assessment of the learning nor an appropriate academic recognition (Taylor, 2011; Mackintosh, McGreal & Taylor, 2011).

Recognition constitutes one of the three incentives of MOOCs (other two are learner's satisfaction and completion). The knowledge of getting newly acquired skills and competences recognised by the higher education institution, education provider or employer encourages the learners to take up courses for the purpose of personal and professional development. More importantly, knowing that a course will not be completed only for the learner's satisfaction can lead to decrease in dropout rates.

The recognition, accreditation and certification could be defined in many different ways, but generally, it refers to establishing a set of arrangements to make visible and value all learning outcomes (incl. knowledge, skills and competence) against clearly defined and quality-assured standards (Yang, 2016). Moreover, according to the ECTS users´ guide "recognition of non-formal and informal learning – the process through which an institution certifies that the learning

outcomes achieved and assessed in another context (non-formal or informal learning) satisfy (some or all) requirements of a particular programme, its component or qualification".

It is relevant to mention that recognition procedures are based on compatibility of learning outcomes rather than comparing the content. This should be mirrored in its open and flexible approach to recognition, aiming at making the lifelong learning a reality and education accessible for all.

Proper recognition and accreditation procedures and certification can offer an educational solution for those who are not in a traditional setting, they can constitute an opportunity of virtual mobility or simply provide a chance of re-skilling or up-skilling employees. However, the adequate usage of those processes is yet to become a reality. The following sections of this paper will provide the insight in the international and European context of the issues of MOOC recognition, accreditation and certification along with outlining the key ones to face in the nearest future.

3. International context

A large amount of MOOC providers as well as researchers are highlighting the need for a solution for the withdraw/dropout rate of MOOCs. It is acknowledged that dropout rates of this kind of courses are rather high (Koutropoulos et al., 2012). A MOOC offered by Coursera in 2012, on Functional Programming Principles in Scala, registered a completion rate of 19.2% (Jordan, 2013). Nevertheless, it must be stated that the majority of MOOCs have completion rates of less than 10% and little is known about the experiences of non-completing MOOC participants (Koutropoulos et al., 2012).

Motivation has been identified as an important contributor to student engagement in a MOOC (Milligan et al., 2013; Milligan et al., 2016). What can motivate people to engage in MOOCs? Individual motivation can go from the desire to achieve an

academic credential at a reduced cost, personal enrichment, up to self-satisfaction (Liyanagunawardena, Adams and Williams, 2013). It must be underlined that having updated information about the actual motivations in place would be valuable, among others, for the design of MOOCs.

According to Milligan et al. (2016), while high self-regulator students establish specific goals related to the course content, the effect on their professional needs and the structure of their learning around the development of content knowledge and expertise (Pintrich, 1999), low self-regulators focus more on their passion for learning, curiosity, or desire to broaden their knowledge. The range of motivation is reflected by the goals set (Zheng et al., 2015; White et al., 2015). Moreover, high self-regulators are pursuing the extension of their knowledge and expertise to benefit their current or future roles independently if they were intending to complete the course, or if the study process was planned more strategically. On the opposite, low-self regulators are not focusing the learning, but mainly their performance, looking for the completition of the course. In this case, the recognition of MOOCs and their accreditation could be a more valuable source of motivation than for high self-regulators.

Together with the monetization, the recognition/certification is one of the most polemic aspects. In fact, the accreditation process opens the door towards an income source at the time it is the way of evaluating the learning process, offering the certification needed/requested by the employers (BIS, 2013). According to Moody´s, regarding the foresight of the incomes of north American HEIs, states that MOOCs certificates should be considered as an experiment in the attempt of obtaining extra incomes by granting credits (Moody’s Investor Service, 2013).

Usually, educational technology companies like Coursera, edX or Udacity conduct MOOCs. These companies are offering different types of certification for which a fee must be paid.

The scale of these fees depends on the type of course. It must be highlighted that certification for a MOOC is offered and recognized by at least one higher education institution. Traditionally learners enrol with one institution and expect to receive the teaching, the content, the assessment and the eventual accreditation from this very same institution (Murray and Friesen, 2011).

Aspects	Coursera	edX
Time frame for deciding the use of the Signature Track or not	3 weeks	
Steps to be taken (authentication procedure)	• **Payment** of $30 to $100 (depending on the course). • Submit a recognized ID (e.g., drivers license) + take a picture of yourself via webcam => **Identification** & **authenticity** • Type a short writing sample, for "**keystroke" signature** to be used after each test.	• **Payment** of $25 to $300 (depending on the course).
Certificates	Payment	Payment
	With HEI	With HEI

Types of certificates	• Verified (the majority are priced at $49) • Specialization (a sequence of courses that culminate into a capstone Project at the en; 45% of Coursera courses offer this kind of certificate)	• Verified (very similar to Coursera´s price strategy) • Professional Education (from $49 to $949) • Credit • XSeries (Recently, for the students who overcome a series of site courses in computer science, a certificate is offered by the Massachusetts Technological Institute. This would be the so-called XSeries certificate offered by edX platform non-luccro MIT and Harvard University. Kolowich (2014) expects to be a trend followed also by other universities in the near future. Different courses offered by Coursera were recognized for granting credits by the Council for Education of the United States: (1) “Bioeletricity: A Quantitative Approach”, Duke University; (2) other ods (3) “Pre-Calculus” and (4) “Algebra” Calofornia University in Invirne; and (5) “Calculus: Single Variable” from the University of Pennsylvania. All five courses are offered through Coursera platform counting with the endorsement of the Council based on the value of these courses to be worthy of official credits.)

Table 1. A comparison of the certification offered by Coursera

and edX. Source: own elaboration.

According to Ronney De Winter from Class Central (Retrived from http://www.ehea.info), reads: “Fair academic and professional recognition, including recognition of non formal and informal learning, is at the core of the EHEA”.

The European Credit Transfer and Accumulation System (ECTS) is a tool of the
European Higher Education Area (EHEA). Hence, it is used only within higher education systems aiming at making studies and courses comparable and transparent. Therefore, it helps enhance the quality of higher education. It started to integrate the experience abroad into the curriculum at mother-university and now it has become a tool to incorporate various types of learning experience into the formal education in lifelong perspective. It can apply to all programmes regardless of the mode of delivery (classroom-based, distance and work-based learning) and learning context – formal, informal, non-formal (European Commission, 2015). Thus, this tool could be potentially used also for the purpose of recognising MOOCs for the purpose of formal education. There are already examples of European universities that offer course credits towards the degree for completion of MOOCs. Through FutureLearn platform, learners can take up courses towards their future programme for free, however should a learner want to pursue with the programme, the access to this may be hampered, as they would have to first pay for the certificate of achievement and final assessment (Ali, 2016).

A British report “The Maturing of MOOCs” clearly states that the increasing formal recognition of MOOCs constitutes a priority for policy-makers and institutions. The accreditation methods said to include badges and adoption of validation techniques (e.g., keyboard tracking, honour codes). Nevertheless, it is worth noting that there is a lack of any systematic solution for policy on credit recognition (Department of Business, Innovation&Skills, 2015).

OpenupEd has provided some indication of their accreditation and funding models. It is suggested that all courses may lead to recognition by means of a completion certificate or a credit certificate that may count towards a degree. The credit certificate comes with a cost attached ranging from €25 to €400, depending on the course length and institution. The majority of courses, despite the use of 11 languages initially and Arabic afterwards, are either in English or Spanish, largely drawn from two large distance-teaching institutions – the Open University and Universidad Nacional de Educación a Distancia (Department of Business, Innovation&Skills, 2015).

According to the European Commission, the European Union is trying to "stimulate teachers and educational institutions to test innovative digital approaches" (Kroes and Vassiliou, 2013). However, without an active participation of students and learners – this goal might be difficult to achieve, therefore the Member States and the European countries should be further encouraged to use the opportunities available for all, not only to a privileged groups of the society. Attempts to better accessibility could exemplified with the practice of Freiburg University in Germany, which started awarding credits for a course offered by Udacity (The economist, 2012).

Daniel et al. (2015) are underlining that in Europe there has not been a"profound reflection on whether MOOC should grant loans and whether these loans could be approved under the credit system"in the European Higher Education (ECTS). But if MOOCs do not grant any credit both in the hybrid and distance models no changes in the higher education system are envisioned as a consequence of this new trend, MOOCs, unless the accreditation of HEIs is coexisting with the MOOCs certificates (Gaebel, 2014).

Given the European System of Mobility among Member States, students can easily transfer credits earned at any university in one of the 53 countries who signed the Lisbon Recognition Agreement, independently if the knowledge, skills and

competences were acquired through non-formal, informal or formal courses. Following the CEO of Iversity, Hans Klöpper, students have the capacity of identifying a high quality courses by the fact that the content is open to anyone. Once the completition of such courses is increasing, the demand for its accreditation will rise as well and for European HEIs will not be easy to resist to the temptation of recognising this new form of learning (The Economist, 2014). Moreover, the legal framework could be adapted in the member states of the European Union as well as in the rest of the countries who signed the Lisbon Recognition Agreement and in line with the governmental requirements for lifelong learning and secondary school (Hollands and Tirthali, 2014).

5. Main obstacles and challenges of recognition, certification and accreditation of MOOCs

Some of the courses that are organised by MOOC providers, offered by MOOC platforms or partnerships lead to either certificate of completion, a badge or credit course. None of those are usually accredited, nor follow any general rules regarding certification of educational courses.

Initially, MOOCs has not aimed at awarding credits at all. The possible confirmation of taking up a MOOC is a certificate of attendance of completion. Even though the courses themselves are free of charge – obtaining any kind of evidence that one has been enrolled or completed such course is often issued upon a fee. Those certificates are designed by the MOOC provider and are usually not formally recognised by any other institution (Geabel, 2013).

It is worth mentioning that within the realm of open online courses the traditional accreditation models are not appropriate (Rodríguez, 2012). The issue is even more complex

when it comes to c-MOOCs as assess or give credits when the participants are not performing the same tasks. Another issue to take into consideration is the fact that many participants are peripheral. The same happens with the content of the courses because it is not static content from the beginning until its completition. The content is on a continues evolution. Hence, perhaps not all types of MOOCs should include a certification but could be used as an introduction to subjects further offered through formal learning tools (Rodríguez, 2012).

Following Bacsich et al. (2013), not many institutions indicate they either produce or use open educational resources and where the production is high, the coordination between institutions is low and the governmental support is lacking or is too low. When it comes to the institutions that are looking for the assessment and accreditation of open courses the numbers are even lower (Conrad et al., 2013). Despite these challenges, the open education movement is a reality.

In order to facilitate lifelong learning, MOOCs should play a role of a bridge between formal and non-formal education and therefore their recognition through, for instance recognition of prior learning should be possible, regardless whether the proof of completion (in the form of credits or certificate) was acquired or not. Eventually, what count is the skills and competences obtained.

Having analysed the available literature and other sources it can be stated that the issue of awarding credits and issuing (accredited) certificates is inseparable from hardly responsive higher education and education and training systems, quality and economic reasons. In this section we will consider those as the key issues hampering recognition, accreditations and certification, commencing with the latter one.

Since the economic crisis the European education discourse has

even more shifted towards the direction of developing a knowledge society that benefits the growth of economies, it is of high importance to acknowledge that education and learning need to be tailored according to the societal needs and not to the needs of the economy solely. Education and learning serve multiple purposes where employability is only one of the facets, along preparing active citizens for life in democratic societies, fostering social mobility, personal development and securing sustainable development for the societies we live in. This should be reflected in how educational opportunities are financed and governed.

To provide an example of how the discourse has been steered by the economic benefits of MOOCs we have carried out an exercise for the purpose of this paper aiming and a limited and selective on-line articles review. All six articles included in our biography constituted a sample for the word analysis exercise. We have been analysing the way the benefits of MOOCs are presented and we found examples of economy-driven narrative, which is shown in the table below.

Citation	Source	Comment
Whatever your opinion, the US-inspired massive open online courses (Moocs) prove the existence of an enormous untapped market for high-quality distance learning and a potentially ***profitable revenue stream.***	Independetnt.co.uk	Commodified language, focus on marketisation instead of wider access to education.

Even if MOOCs can coin sound academic currency, ***they must also make real money.*** *(…) The first way of generating revenue is a "freemium" model, in which* ***the course is free but the graduation certificate is paid-for.***	The economist	Commodified language, focus on marketisation instead of wider access to education. Emphasis on the fact that a learner cannot obtain a 'proof of attendance and results' unless they pay.
If students can prove that [that means acquiring certain skills – authors' note]*, they will not have to pay tuition – at least not unless so many students ask for credits that the* ***university needs to start charging a fee to handle all the requests.***	Inside Higher Ed	Refers specifically to recognition process as a costly procedure that a learner will have to cover the costs of.

OpenupEd, says the report, has suggested that all its courses may lead to recognition, "for example with a completion certificate or a credit certificate that may count towards a degree". There will be costs attached to credit certificates, ranging from €25 to €400 (US$540), depending on the course length and institution.	The University World News	Emphasis on the fact that a learner cannot obtain a 'proof of attendance and results' unless they pay.

Table 2. Review of selected articles in Web magazines about MOOCs. Source: own elaboration.

On of the issues arising from the current status of MOOCs is the misleading narrative. MOOCs are said to be tools that could cater for the educational needs of those who cannot pursue their professional education due to, in the majority of the cases, socio-economic reasons. However, even after having completed a course, an individual may not be able to use skills or competences acquired, as the way they were obtained, even though it should not make any difference, is an obstacle for the skills and competences to be fully recognised by a HEI or employer.

6. Conclusions and considerations

for the future

It is clear that a legal framework regarding the recognition/certification/accreditation on non-formal and informal education could facilitate the evolution of the education system as well as its adaptation to the needs and requirement of the XXI century society.

There is no doubt that this process didn´t even started at a global level, but there is interest in this sense at least at European level. Moreover, the needs of adaptation and of diversifying incomes of educational institutions (universities or not) put new methodologies as MOOCs in the spotlight of these institutions. The costs and the knowledge needed for producing and offering MOOCs conducted to increasing need of synergies between universities and different platforms like Coursera, edX, Udacity, etc.

The proliferation of MOOCs included also new challenges and new requirements from the consumers of MOOCs. Among others, the recognition of this type of courses started to be one of the most important issues to be solved by the producers. Universities count with the trust of society in the accreditation process of formal learning. Thus, higher education institutions are needed. Without their involvement, the process is not covering the needs of the consumers. However, academic boards and senates of many universities are hostile to reuse open-licensed courses and associated assessments even though those materials have been formally approved by another accredited university and even though these open courses can be adapted locally at no cost and offered in parallel with existing courses in order to diversify curriculum at the home institution. This reticence could be translated into a poor business strategy and foresight.

Additionally, governmental bodies should and could be involved

in order to give an even stronger support to this process of accreditation and to the official certificates requested and liked to new teaching/learning methodologies as MOOCs.

Note

References

Bacsich, P., Nie, M., Jeans, N., Schuwer, R., Karran, T., Witthaus, G. (2013). POERUP Elevator Pitch: 26 Countries in 26 Minutes, *Slideshare* March 27th. Retrieved from http://www.slideshare.net/witthaus/poerup-elevator-pitch

Bell, F. (2010). *Network theories for technology-enabled learning and social change: Connectivism and actor network theory*. Paper presented at the Seventh International Conference on Networked Learning, Aalborg, Denmark. Retrieved from http://www.lancs.ac.uk/fss/organisation/netlc/past/nlc2010/abstracts/Creanor.html

BIS (2013). The maturing of the MOOC: Literature review of massive open online courses and other forms of online distance learninig. BIS Research Paper 130. Retrived from http://www.gov.uk/government/uploads/system/upload/attachemnt_data/file/240193/13-1173-maturing-of-the-mooc.pdf

Camilleri, A.F. and Tannnhäuser, A.-C. (2012). Open learning recognition: Taking open education resources a step further. Brussels, Belgium: EFQUEL.

COM/2013/0654 final, *Opening up Education: innovative teaching and learning for all through new Technologies and Open Educational Resources*, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

Conrad, D. (2013). Assessment challenges in open learning: Way-finding, fork in the road, or end of the line? Open Praxis 5(1): 1-7. Retrived from http://dx.doi.org/10.5944/openpraxis.v5i1.17

Conrad, D. and McGreal, R. (2012). Flexible paths to assessment for OER learners: A comparative study. Journal of Interactive Media in Education 2. Retrived from http://www-jime.open.ac.uk/jime/article/view/2012-12

Daniel J., *Making Sense of MOOCs – Musings in a Maze of Myth, Paradox and Possibility, in: Academic Partnerships*, 12/2012. Retrived from http://doi.org/10.5334/2012-18

Daniel, J.,Vásquez, E., Gisbert Cervera, M. (2015). El fututro de los MOOC: ¿aprendizaje adaptativo o modelo de negocio? Revista de Universidad y Sociedad del Conocimiento 12(1): 64-73. Retrived from http://dx.doi.org/10.7238/rusc.v12i1.1887

DeBoer, J., Ho, A.D., Stump, G. S., Breslow,L. (2014). Changing 'Course' Reconceptualizing Educational Variables for Massive Open Online Courses, EDUCATIONAL RESEARCHER 43(2): 74–84.

Department of Business, Innovation&Skills, *The Maturing of the MOOC – literature review of Massive Open Online Courses and other forms of distance learning*, Research Paper no 130, September 2015, London.

European Commission, Education and Culture Directorate General, (2015).ECTS *Users' Guide*, Luxembourg: Publications Office of the European Union.

European Commission/EACEA/Eurydice, (2015). *The European Higher Education Area in 2015: Bologna Process Implementation Report*. Luxembourg: Publications Office of the European Union.

European Students' Union (ESU) (2013a). Policy paper on quality of higer edcuation (amended). Retrived from

http://www.esu-online.org/news/article/6064/Policy-paper-on-quality-of-higher-education/

European Students' Union (ESU) (2013b.) Quest for Quality for Students: A Student Quality Concept

European Students' Union (ESU) (2016.) Introduction to ESU's policies in higher education (amended). Retrived from http://www.esu-online.org/news/article/6064/Introduction-to-ESUs-policies-in-higher-education/

European Recognition Manual, second edition, (2016). Retrived from http://www.esu-online.org/asset/News/6001/8220_European-Recognition-Manual-Second-Edition-FIN.pdf

Fain, P. (2014). Ideas take shape for new accreditors aimed at emerging online providers. *Inside Higher* Ed. Retrived from http://www.insidehighered.com/news/2014/05/09/ideas-take-shape-new-accreditors-aimed-emerging-onlineproviders#sthash.TrrbNDAP.dpbs

Friesen, N. and Wihak, C. (2013). From OER to PLAR: Credentialing for open education. Open Praxis 5(1): 49-58. Retrvied from http://dx.doi.org/10.5944/openpraxis.5.1.22

Gaebel, M. (2013). *EUA Occasional Papers, MOOCs – Massive Open Online Courses*, EUA. Retrived from http://www.eua.be/Libraries/publication/EUA_Occasional_papers_MOOCs.pdf?sfrsn=0

Gaebel, M. (2014). MOOCS Massive Open Online Courses. *European University Association*, 1-35. Retrived from https://oerknowledgecloud.org/content/moocs-massive-open-online-courses

Hollands, F. y Tirthali, D. (2014). MOOCs: expectations and reality. Full report . Nueva York: Columbia University, Center for Benefit-Cost Studies of Education, Teachers College.

Retrived from http://cbcse.org/wordpress/wp-content/uploads/2014/05/MOOCs_Expectations_and_Reality.pdf

Kolowich, S. (2013a). A University's Offer of Credit for a MOOC Gets No Takers, The Chronicle of Higher Education.

Kolowich, S. (2013b). American Council on Education recommends 5 MOOCs for credit. *The Chronicle of Higher Education*. Recuperado de https://chronicle.com/article/American-Council-on-Education/137155/

Kolowich, S. (2014). Coursera will offer certificates for sequences of MOOCs. *The Chronicle of Higher Education*. Retrived from http://www.chronicle.com/blogs/wiredcampus/coursera-will-offer-certificates-for-sequences-of-moocs/49581

Kroes, N., Vassiliou, A. (2013). *Opening up Education – Making the 21th century classroom a reality. European Commission*. Retrived from http://europa.eu/rapid/press-release_SPEECH-13-747_en.htm?locale=en

Liyanagunawardena, T.K., Adams, A.A., Williams, S.A. (2013). MOOCs: A Systematic Study of the Published Literature 2008-2012. The international Rewview of Research in Open and Distributed Learning14(3):202-227. Retrived from http://www.irrodl.org/index.php/irrodl/article/view/1455/2531

MacGregor K., (2013). *MOOCs make waves in higher education worldwide, University World News*. Retrived from http://www.universityworldnews.com/article.php?story=20130920142318192&query=MOOC

Mackintosh, W., McGreal, R., Taylor, J. (2011). Open Education Resources (OER) for assessment and credit for students' projects: Towards a logic model and plan for action. Retrieved

from. Retrived from http://hdl.handle.net/2149/3039

McGreal, R., Conrad, D., Murphy, A., Witthaus, G., Mackintosh, W. (2014). Formalising informal learning: Assessment and accreditation challenges within disaggregated systems. Open Praxis 6(2): 125-133. Rtrived from http://www.openpraxis.org/index.php/OpenPraxis/article/view/114

Milligan, C., Margaryan, A., Littlejohn, A., (2013). Patterns of engagement in massive open online courses. MERLOT Journal of Online Learning and Teaching, 9(2), 149-159. Retrieved from http://jolt.merlot.org/vol9no2/milligan_0613.pdf

Milligan, Colin, Littlejohn, A., Hood, N. (2016). Learning in MOOCs: A Comparison Study, Proceedings of the European Stakeholder Summit on experiences and best practices in and around MOOCs. In: Proceedings of the EUROPEAN STAKEHOLDER SUMMIT on experiences and best practices in and around MOOCs (EMOOCS 2016) (Khalil , Mohammad; Ebner, Martin; Kopp, Michael; Lorenz, Anja and Kalz, Marco eds.), Karl-Franzens-Universit ät Graz, Graz, pp. 15–26. Retrived from http://oro.open.ac.uk/46383/8/Learninginmoocs.pdf

Moody´s Investor Service (2013). US Higher Education Outlook Negative in 2013. Retrived from https://www.moodys.com/research/Moodys-2013-outlook-for-entire-US-Higher-Education-sector-changed–PR_263866

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*, 31, 459-470.

Rivard R., Rubber Hits the Road, (2013). Inside Higher Education. Retrived from https://www.insidehighered.com/news/2013/08/08/researchers-wait-see-if-students-want-transfer-credits-moocs

Rodriguez, C. O. (2012). MOOCs and the AI-Stanford like

Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses. European Journal of Open, Distance and E-Learning. Retrived from http://www.eurodl.org/index.php?p=archives&year=2013&halfyear=2&article=516

Schroeder, R. (2012). Emerging Open Online Distance Education Environment, Continuing Higher Education Review 76: 90– 99.

Taylor, J. C. (2011). The OER university: From logic model to action plan. Keynote Address. Open Planning meeting for the OER assessment and credit for students project, Otago Polytechnic, 23 February 2011, Dunedin, New Zealand. Retrieved from http://wikieducator.org/OERU_meeting_summary

The Economist, (2012). *Online courses are transforming Higher Education creating new opportunities*. Retrived from http://www.economist.com/news/briefing/21605899-staid-higher-education-business-about-experience-welcome-earthquake-digital

Tickle L., (2014). *Will degree made up of MOOCs ever be worth the paper it's written on?*, The Guardian. Retreived from http://www.theguardian.com/higher-education-network/blog/2014/jun/12/moocs-viable-alternative-traditional-degree

Todorovski B., E. Nordal, T. Isoski, (2015). *Overview on student-centred learning in Higher Education in Europe – research study*, Brussels: the European Students' Union.

UNESCO, (2015). *Education 2030: Framework for Action, Towards inclusive and equitable quality education and lifelong learning for all*. Retirved from http://unesdoc.unesco.org/images/0024/002432/243278e.pdf

UNESCO, *Framework for Action, Towards inclusive and equitable education and lifelong learning for all*. Retrived from http://unesdoc.unesco.org/images/0024/002432/243278e.pdf

Universities UK (2013). *Massive open online courses: higher*

education's digital moment? Retrived from http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2013/massive-open-online-courses.pdf

Vassiliou, A. (2013). *First European MOOCs – a milestone for education. European Commission*, April 25, [cited April 25 2013]. http://europa.eu/rapid/press-release_SPEECH-13-368_en.htm?locale=en

Verstelle, M., Schreuder, M., Jelgerhuis, H. (2014). *Recognition of MOOCs in the education sector, in: Open Education Trend Report 2014*.

Weller, M. and Anderson, T. (2013). Digital resilience in Higher Education. In *European Journal of Open, Distance and E-Learning, 16(1)*. Retrived from http://oro.open.ac.uk/36988/1/Weller_Anderson.pdf

White, S., Davis, H., Dickens, K. P., Leon, M., & Sanchez Vera, M. (2015). MOOCs: What motivates producers and participants. In S. Zvacek, M. Restivo, J. Uhomoibhi, & M. Helfert (Eds.), *Proceedings of the 6th International Conference on Computer Supported Education* (pp. 99-114). Heidelberg: Springer.

Yang, J. (2015). *Recognition, validation and accreditation of non-formal and informal learning in UNESCO Member States*, UNESCO Institute for Lifelong Learning.

Yuan, L., Powell, S. (2013). *MOOCs and Open Education: Implications for Higher Education*. Retrived from http://publications.cetis.org.uk/2013/667

Zheng, S., Rosson, M. B., Shih, P. C., Carroll, J. M. (2015). Understanding Student Motivation, Behaviors and Perceptions in MOOCs. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 1882-1895). ACM.

Zhenghao C., Alcorn B., Christensen G., Eriksson N., Koller D., Emanuel, J. E. (2015). *Who's Benefiting from MOOCs, and Why, in: Harvard Business Review*, 22 September 2015. Retrived from https://hbr.org/2015/09/whos-benefiting-from-moocs-and-why