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MOOCs for Social Inclusion & Employability

Cost-Benefit Analysis of MOOC Provision

Applying triple-bottom line reporting to MOOCs and Distance Learning

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1.   Table of Contents

2.   Introduction

In the context of MOONLITE project (reference number 2015-3243 / 001-001), which examines the application of MOOCs in contexts of social inclusion and employability, the need to analyse both the efficacy of MOOC-based interventions and to compare the opportunity cost of investing in MOOCs versus other interventions must be considered. This activity in MOONLITE therefore aimed to:

- Create a framework for measuring overall impact of a MOOC, as well as the efficiency of interventions;
- Test the framework in participating institutions within the MOONLITE project;
- Use the feedback to improve the impact measurement tool, as well as to
- Extrapolate general conclusions about institutional approaches to MOOCS in contexts of social inclusion and employment.

3.   Frameworks for Sustainability Reporting

Our analysis of existing frameworks for sustainability reporting within universities identified the following frameworks as being either used or whose use has been proposed in literature:

Auditing Instrument for Sustainability in Higher Education (AISHE)

The auditing instrument AISHE is designed to measure the level to which sustainable development has received a place in the education of an institution (or a part thereof). In short: AISHE measures "sustainable education". The AISHE-method is based on a model for quality management, developed by the European Foundation for Quality Management, and enhanced by the Institute for Dutch Quality Management (INK). For this reason, it is called the "EFQM-INK model". In the EFQM-INK model the idea is that organizations can be in one of several development stages with respect to a number of criteria. The model defines five of these stages. The original EFQM-INK model has been developed to be used in commercial companies, for instance in industry. A group of Dutch Universities for Vocational Education an has been it for Higher Education. Instead of themes concerning production processes, in the educational version themes are described concerning educational processes. It is this model, which may be called "EFQM-HE", which has been chosen as a basis for AISHE. (Pipjelink, 2011)

Eco-Management and Audit Scheme (EMAS)

The EMAS Regulation (Reg 761/01 EC) is EU scheme implemented by the European Commission since 1993 and it is for the implementation of an Environmental Management System (EMS) by any organization. The EMS was originally proposed by the European Commission and by the ISO as the frontrunner of a series of policy tools that enable companies to simultaneously pursue environmental objectives and competitive targets in a synergetic way. (Iraldo, Testa, & Frey, 2009)The EMAS requires organizations to formulate a comprehensive environmental management system which should ideally cover the entirety of the implementing organization's activities and operations. (Strachan, Haque, McCulloch, & Moxen, 1997)

Education for Sustainable Development Toolkit

The Education for Sustainable Development Toolkit is based on the idea that communities and educational systems within communities need to dovetail their sustainability efforts. As communities develop sustainability goals, local educational systems can modify existing curriculums to reinforce those goals. The toolkit consists of a set of exercises to help communities develop such goal sustainability goals or

action plans on which to base educational change. (McKeown, Hopkins, Rizi, & Chrystalbridge, 2002)

Global Reporting Initiative (GRI)

The Global Reporting Initiative (GRI) contains the reporting guidelines most commonly used by international companies, even though these guidelines do not make for standardization of reporting (Morhardt, Baird and Freeman, 2002).

Sustainability reporting, as promoted by the GRI Standards, is an organization's practice of reporting publicly on its economic, environmental, and/or social impacts, and hence its contributions – positive or negative – towards the goal of sustainable development. Through this process, an organization identifies its significant impacts on the economy, the environment, and/or society and discloses them in accordance with a globally-accepted standard.

The GRI Standards create a common language for organizations and stakeholders, with which the economic, environmental, and social impacts of organizations can be communicated and understood. The Standards are designed to enhance the global comparability and quality of information on these impacts, thereby enabling greater transparency and accountability of organizations (Global Reporting Initiative, 2016).
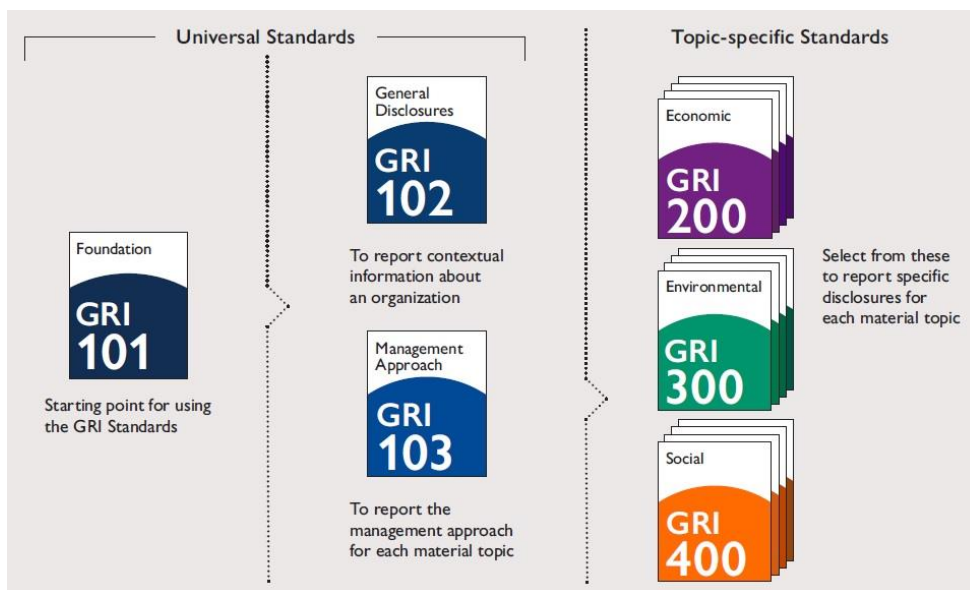
The GRI guidelines do not require companies to fulfil or handle all topics. Thus, companies are free to choose from the guidelines in any way they prefer, and this contributes to the difficulty of assessing social reporting quality (Romolini, Fissi, & Gori, 2015). The GRI is the world's most widely used survey of planning systems.

Graphical Assessment for Sustainability in Higher Education (GASU)

The Graphical Assessment of Sustainability in Universities (GASU) 2010 has been designed to provide an analysis of current sustainability efforts in the university with respect to: profile; economic dimension; environmental dimension; and social dimension, based on the GRI G3 Sustainability Guidelines. These are complemented with two additional dimensions: Educational dimension and Interlinking issues and dimensions.

GASU results are presented in eleven charts: a General chart (which presents the performance of economic, environmental, social and educational dimensions); Profile; Economic dimension; Environmental dimension; five for the Social dimension (overall, labour practices and decent work, human rights, society, and product responsibility); Educational dimension; and Inter-linked issues and dimensions.

GASU can help universities on their road towards sustainability by making recommendations as to where the university should affect the changes needed to make its system more sustainability oriented, and thus be better aligned with the UN Decade of Education for Sustainable Development. GASU can also facilitate comparisons of the university's efforts and achievements towards sustainability in different years, as well as benchmarking against other universities (Lozano, 2006).

ISO 26000 – Social Responsibility Guidance

ISO 26000 is intended to assist organizations in contributing to sustainable development. It encourages them to go beyond legal compliance, recognizing that compliance with the law is a fundamental duty of any organization and an essential part of their social responsibility programme.

When applying ISO 26000, organizations should consider societal, environmental, legal, cultural, political and organizational diversity as well as differences in economic conditions, while being consistent with international norms of behaviour (International Organisation for Standardisation, 2014) . The standard addresses seven core subjects of social responsibility, namely:

Sustainability Tracking, Assessment & Rating System (Stars)

STARS® encompasses long-term sustainability goals for already high-achieving institutions, as well as entry points of recognition for institutions that are taking the first steps toward sustainability. STARS is designed to provide a framework for understanding sustainability in all sectors of higher education and enable meaningful comparisons over time and across institutions using a common set of measurements developed with broad participation from the international campus sustainability community. It also facilitates information sharing about higher education sustainability practices and performance. At the time of writing 967 institutions throughout the United States and Canada had submitted a sustainability report through the system which is run by the Association for the Advancement of Sustainability in Higher Education.

4.   Approach

Following assessment of different approaches to impact assessment and cost-benefit analysis, Triple Bottom Line Reporting was identified as the most suitable approach, given its focus on financial, environmental and social costs and benefits.

Newport, Chesnes and Lindner (2003) underlined that if a university wants to benchmark its sustainability performance, it has to compare itself by using GRI indicators, as most other existing instruments suffer from egocentrism and/or lack of comparability. Furthermore, ISO 26000 is widely applied by companies and institutions with less formalised reporting paradigms. The system operated by AASHE also has widespread adoption, but is aimed for a United States/Candaian system, while all the other systems investigated have had limited uptake. Given this, we selected ISO 26000 and the GRI as a starting framework from which to extract indicators for MOOCs.

Each criterion in the systems were analysed against a number of different aspects, namely:

- Is the criterion significant for MOOC-based provision?
- Is there a MOOC specific dimension to the criterion?
- Can the indicators be realistically collected by a university?
- Are there related, criteria which may be relevant under the headings of the standard, but which are not specifically suggested by the standard?

This analysis led to the suggestion of 26 indicators across the three domains. These were then structured using the following format:

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
Students Given Access to Education	Students given access to study a subject area they would not have otherwise studied thanks to MOOCs	# of students OR # of student-study hours (ECTS-equivalents)	ISO 26000: 6.3.9 GRI G4: 412	Pre-Course Survey: 1.Would you have tried to study this subject elsewhere if it was not offered as a (free & online) MOOC? Yes / No	
Participation of Students from Vulnerable Groups	Students from vulnerable groups participating in MOOCs	# of students per target group (e.g. refugees) # of student-study hours (ECTS-equivalents) per target group	ISO 26000: 6.3.7 GRI G4:	Pre-Course Survey: 1.Do any of the following conditions apply to you? (tick-box answers of target groups, including refugees/migrants)	Ratio of vulnerable group participation vis-à-vis traditional courses
Discrimination complaints received	Incidents of Discrimination on the grounds of race, color, sex, religion, political opinion, national extraction, or social origin, or other relevant forms of	# of (verified) complaints received on these issues	ISO 26000: 6.3.7 GRI G4: 406.1	Records from complaints department, QA department, or other body entrusted with receiving and documented complaints	Ratio of complaints vis-à-vis traditional courses

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
	discrimination				
Sustainability Education	Teaching & Learning which expand civil & political rights	# of MOOCs specifically intended to expand civil & political rights OR # of students from low-freedom countries following these MOOCs	ISO 26000: *6.3.8* GRI G4:	MOOC Course Catalogue: courses treating civic & political rights as defined by UDHR and subsequent treaties Freedom to be determined as 'not free' or 'partially free' based on Freedom House ranking Source countries of students through pre-course questionnaire	
Free Education	Quantity of Free Education Provided through to MOOCs	# of student-study hours (ECTS-equivalents)	ISO 26000: 6.3.9 GRI G4:	Student participation rates from learning analytics platform	Quantity of extra-education provided due to free-status (HtM: Post-Evaluation Questionnaire: How much would you be willing to pay for this

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
					MOOC?)
Workers	Employees & Subcontractors working on MOOC Programme	# of employees in FTEs	ISO 26000: 6.4.3, 6.4.4, 6.4.7 GRI G4: 401	Number of full-time employees, part-time employees and subcontractors working on MOOC programme, together with percentage dedication to MOOC Programme Number of employees which are new hires	What are the differences in wages, promotion opportunities and other rights between different classes of worker? Do these differ between MOOC programmes and traditional programmes?
MOOcs for CPD	CPD offered through MOOCs	Average hours of training per year per employee	ISO 26000: 6.4.7 GRI G4: 404.1	CPD records or learning analytics from MOOCs	
Training in MOOCs	CPD offered through in MOOC design, development and operation	Average hours of training per year per employee OR Number and name of	ISO 26000: 6.4.7 GRI G4: 404.2	CPD records or learning analytics from MOOCs	

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
		programmes offered			
Licencing of Content	a.Ratio of Open vs Closed vs No Licences for used content in MOOC creation b.Volume of content created c.Ratio of Open vs Closed vs No Licences for content created for MOOC	Ratio in words, minutes, percentage of course materials or # of resources	ISO 26000: 6.6.7 GRI G4: *additional*	Check licences of all content used and produced.	Check licences of all content used and produced.
Accreditation Status	MOOCs which lead to an accredited qualification	% of MOOCS	ISO 26000: 6.7.3 GRI G4: 4.17.1	MOOC Catalogue	
Marketing Complaints	Complaints received linked to inaccurate, incomplete or clear public information about MOOC	# of complaints	ISO 26000: 6.7.3 GRI G4: 4.17.2	Analysis of complaints system	

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
	Programme				
Completion Rate	Students who successfully complete the course.	% of students who complete MOOC	ISO 26000: 6.7.3 GRI G4	MOOC learning analytics	
Data Protection	Students who (un)successfully have their data protected	# of % of students affected by data incides incl. leaks, thefts, misuses or losses of customer data	ISO 26000: 6.7.7 GRI G4: 4.18.1	Analysis of data incidents	
Support, Complaints and Resolution	Level of service for students to have their questions or complaints satisfactorily resolved	Average time to resolution for different classes of queries	ISO 26000: 6.7.6 GRI G4:	Data from issue management system	
Access to learning	Possibility to follow MOOCs despite low connectivity	Ratio of # of MOOCs which require broadband : # which require low	ISO 26000: 6.7.8 GRI G4:	MOOC Catalogue	

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
		bandwidth : # which require only intermittent internet access			
Energy Consumption	Units of energy which are emitted directly by the MOOC department	units of energy	ISO 26000: 6.5.4 GRI G4: 3.02.1	Utility bills	% of energy from renewable sources
Scope 2 Emissions within the Organisation	CO2 Emissions which are emitted directly by the MOOC department	kg of Carbon	ISO 26000: 6.5.4 GRI G4: 3.05.2	Calculation of GHG use from utility providers	
Indirect Energy Consumption	Units of energy which are emitted indirectly by the MOOC department's staff, students and suppliers	units of energy	ISO 26000: 6.5.4 GRI G4: 3.02.2	Calculation of energy consumption of travels of staff and reporting from suppliers	
Scope 3 Emissions within the	CO2 Emissions which are emitted indirectly by the MOOC	kg of Carbon	ISO 26000: 6.5.4	Calculation GHG emissions from travels of staff and reporting from suppliers	

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
Organisation	department's staff, students and suppliers		GRI G4: 3.05.3		
Energy Saved	Units of energy which would have been emitted should students have travelled to campus for lessons + savings due to mitigation measures	units of energy	ISO 26000: 6.5.3 GRI G4: 3.02.4, 3.02.5	Pre-Course Questionnaire: Where are you based? Use CO2 Calculator to calculate kg of Carbon for distance to institution (based on land or air travel as appropriate for distance). Comparisons with previous year figures for impact of other initiatives.	Are the students choosing online study as an alternative to physical study?
CO2 Emissions Saved	GHG Emissions which would have been emitted should students have travelled to campus for lessons + savings due to mitigation measures	kg of Carbon	ISO 26000: 6.5.3 GRI G4: 3.05.5		

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
Energy Intensity	Units of energy (total) consumed per unit of production	units of energy / student OR units of energy / learning hour (ECTS equivalents)	ISO 26000: GRI G4: 3.02.4, 3.02.5	Pre-Course Questionnaire: Where are you based? Use CO2 Calculator to calculate kg of Carbon for distance to institution (based on land or air travel as appropriate for distance). Comparisons with previous year figures for impact of other initiatives.	Are the students choosing online study as an alternative to physical study?
GHG Emissions Intensity	GHG Emissions released per unit of production	kg of Carbon / student OR kg of Carbon / learning hour (ECTS equivalents)	ISO 26000: GRI G4: 3.05.5		
Land saved	Land which does not need to developed due to MOOC provision	m^2	ISO 26000: 6.5.6 GRI G4: *additional*	Calculate m2 of classrooms / full-time student at institution, and use to estimate how much additional space would be required to accommodate MOOC population physically	
Sustainability	Teaching & Learning on Sustainability	# of MOOCs OR	ISO 26000:	MOOC Course Catalogue	**Additional** teaching & learning on

Indicator	Description	Unit of Measurement	Contributes to Reporting	How to Measure	Extensions
Education	Topics offered via MOOCs	# of student-study hours (ECTS-equivalents)	*additional* GRI G4: *additional*		sustainability topics offer via MOOCs

6.   Activities and Results

Using a semi-standardised reporting template, four institutions took part in the analysis:

ESCP has recently started developing its online teaching; therefore the objectives of it are not systematically quantified and measured. The aim of the analysis was to initiate a dialogue on the topic and its necessity, with board members, professors and responsible for the school's digital strategy. In particular, it applied the analysis to the first digital learning offer produced by the ESCP: the MOOC 'Intercultural Management'.

Questions arose as to whether the goal of the ESCP is currently to measure its MOOC objectives or whether efforts should be put on understanding how to retain MOOC learners in the long term. However, although the objectives are not systematically quantified and measured as of today, they will certainly be in the future.

By considering the number of learners coming from emerging countries, the total number of learners, the number of female learners, the number of unemployed learners % of 40 + , ESCP managed to show the social impact of the MOOC. It found that the MOOC fosters social inclusion and employability by providing free training on an essential competence of each individual working in an organizational context: cross-cultural ability.

Specifically, by measuring the number of women and unemployed who participate in the MOOC, ESCP proved that the MOOC support individuals that are likely to be discriminate on the labor market. In addition, by measuring the number of unemployed, looking for being socially included through work opportunities, the analysis showed how the MOOC helps them to extend their knowledge, skills and abilities while being on the job market.

Finally, by measuring the amount of learning being delivered to emerging countries, the analysis showed how the MOOC achieves its aim at promoting the inclusion of individuals lacking opportunities and making them aware of their strengths (e.g. being able to speak several languages) and showing them a large range of opportunities.

Although the school does not systematically quantitatively measured its impact at the time of the analysis, this output has made its staff aware of this opportunity and of the available data to do so. Using the demographics information about MOOC participants and number of learners is seen as a valuable way to evaluate whether the MOOCs is beneficial for the school, the beneficiaries and society at large.

LNU used the cost-benefit analysis tool to take a snapshot of the cost-benefit of the MOOC "Fantastic Fiction and where to find it". It was conducted in the first instance as a one-off exercise which only required reporting their current status in order to gain insights for discussion. In a longer perspective it will also be a useful tool for internal

management and monitoring purposes. Indicators suggest by the cost-benefit tool, led the institution to the following insights:

The number of students and their places of residence participating in the MOOC Fantastic Fiction and where to find it, leads to the conclusion that the recruitment of international students has succeeded. In particular, the number of students from newly industrialized and BRIC countries are indicators of the MOOC's social impact. Furthermore, some participants testify that in their home countries not all students gain equal chances for education. Due to the lack of specific measures it is unclear whether the student's recruitment also has succeeded in attracting more students from different socioeconomic backgrounds. However, the student's feedback indicates that this is the case. The MOOC thus contributes both to an individual educational claim and to a professional qualification.

The MOOC provides specific knowledge about fantasy fiction. For the learners, this also means that they train their language skills in English in collaboration with other learners and, because parts of the course content mediate Swedish literature and research, also broaden their intercultural and cultural knowledge. Because the entire course material is open-access and planned with respect to learners with special needs, it also meets the inclusiveness criterion. Working with the CBA has also made the team aware that the MOOC has reduced travel costs and has made a positive impact for environmental protection.

Another side effect is that the colleagues became aware of certain goals, e.g. equal opportunities for education as core values of the university were also considered in the planning of the MOOC. A concrete goal formulation and evaluation were only insufficiently considered and could be improved.

UNED applied the methodology to get a snapshot of the cost-benefit of using open educational resources and practices as part of their overall educational portfolio. UNED is a public university that has a clear commitment towards facilitating access to higher education of the widest possible social demographic. It is in this sense that the two goals of the application of the Cost Benefit Analysis tool were selected.

Firstly, social responsibility at UNED, as the provision of educational services in an ethical fashion, is clearly a priority at the university, and reflects its social commitment and the promotion of civic values. Secondly, supporting vulnerable groups and preventing discrimination underlies a lot of the activities undertaken with disadvantaged groups who study with us, including people with disabilities and those in prisons.

The approach to the analysis undertaken and the data used in it were gathered from previous reports available at the university together with data currently logged. For a finer grained analysis to be undertaken in future iterations of this process it would be necessary to gather specific data correlating vulnerable groups with the results they obtain, not only in formal accredited study programmes but also in MOOCs, downloads

of OCW materials, use of the institution's iTunes U channel, etc. Specifically, given the university's work with displaced people, like refugees in the MOONLITE project, it would be of interest to gather data specifically on this collective and the studies undertaken by them.

It should be noted that management at UNED already have a data-oriented perspective in managing the educational process but this is currently not potentiated across all areas of institutional activity which poses challenges for researchers to analyse recorded data.

The analysis allowed UNED to get a better idea of its social impact, gathering together disparate indicators from across the institution. However environmental analysis proved impossible.

WU attempted to apply the analysis to its education observatory, which is a research institute within the University of Wolverhampton. In looking at a Cost Benefit Analysis of the Education Observatory, and recognising its role in promoting educational research and innovation - and thus recognising it as one obvious catalyst for MOOCs - it was seen that the complexity of the environment around the Observatory and the ways in which institution aspirations are cascaded down to the Observatory makes any analysis other that either income or research output difficult to imagine or undertake and thus the odds are stacked against MOOCs as the engine of local social inclusion, academic progress or gainful employability.however, due to institutional limitations on reporting was unable to gather any relevant data. Since the cost-benefit tool was designed to be applied to MOOC-programmes *per se* rather than research institutes, this may have also contributed to the difficulty in reporting.

6.1. Indicators Used

The following table presents an overview of the indicators used by the four pilots in their respective Cost Benefit Analyses. Indicators chosen are mixture of ones directly suggested by the CBA grid presented above, and related indicators which were inspired by the tool:

Institution	Environmental Indicators	Social Indicators	Business Indicators
ESCP	**Environmental footprint of each MOOC participant** Travel saved	**Diversity of cultures** Percentage of learners coming from emerging countries **Diversity of social background** Percentage of	**Brand promotion** (number of students reached through running the MOOC) **Improvement of Intercultural Orientation** (number of students reached through running the MOOC)

Institution	Environmental Indicators	Social Indicators	Business Indicators
		female learners Number of unemployed learners	
LNU	**Energy Intensity**: travel saved	**Students given access to education** Number of students **Licensing of content** open access resources produced	*none*
UNED	*none*	**Free Education.** Quantity of Free Education Provided through to MOOCs **Licensing of Content.** Open vs Closed vs licenses for content in MOOCs **Data Protection.** The number of students affected by data incidents including leaks, thefts, misuses or losses of customer data **Support, Complaints and Resolution.** The level of service for students to have their questions or complaints	*none*

Institution	Environmental Indicators	Social Indicators	Business Indicators
		satisfactorily resolved. Average time to resolution for different classes of queries **Access to learning.** The possibility of following MOOCs from low connectivity network conditions **Participation of Students from Vulnerable Groups**	
WU			**Research income** using the university's accounting procedures, not profit **Research output** both total and per capita **Research degree completions and time-to-completion** **Evidenced impact,** policy, practice, societal, commercial or other changes outside academia that can be attributed and evidenced as due to specific research outputs **Esteem** as measured by press and media coverage, keynotes, national boards and panels etc

7. Discussion & Conclusions

Worldwide, universities are still in an early stage of adoption of sustainability indicators. Universities are making efforts, in more or less intensity, toward sustainability, but these initiatives are reported in fragmented ways—such as on websites, in different reports or in university brochures—therefore, universities may be failing to exploit opportunities to improve their positioning compared with competitors. However, the adoption of SR standards can help to add value to all universities' sustainability initiatives and improve their visibility and reputation (del Mar Alonso-Almeida, Marimon, Casani, & Rodriguez-Pomeda, 2015).

From the limited pilot conducted within the framework of the MOONLITE project it is clear that in participating institutions, **the impact of MOOCs is not being measured against either Financial, Social or Environmental criteria**. This implies that demonstrable impact (as well as costs) is not the main driver of MOOC development. While more research would be needed to confirm this, interviews with piloting institutions indicate that MOOC programmes are considered experimental, with success criteria being defined as ascertaining pedagogical appropriateness of the medium, and the institution's 'ability to offer' such programmes. Other possible reasons include 'fear of missing out' given the MOOC bubble within European institutions, and the inclusion of MOOCs as a vague action within wider Corporate Social Responsibility or institutional promotion packages.

Despite the limitations of participating partners in trying to implement the framework, the value of such an approach was recognised by all participants. In particular, the framework allowed for improved understanding of how MOOCs contribute to institutional diversity, improving motivation for learning and internationalisation of the institutions.

This said, while social impact was considered relevant for partners, environmental impact was not a factor in decisions to offer or continue MOOC programmes. In fact none of the participating institutions measure the environmental cost of MOOCs or have implemented MOOCs to reduce their environmental footprint. Despite the fact that institutions have overall environmental strategies, it seems that the possibilities of MOOCs to contribute such strategies are still not recognised, reflecting previous studies that also point out environmental factors as the most under-reported and implemented by universities (Jorge, Madueño, Cejas, & Peña, 2015).

A major limiting factor of the approach is that none of the participating institutions do granular analysis of the cost-benefits of any of their individual programmes. Institutional success tends to be driven be the priorities of those funding the programmes. Thus, for public institutions indicators are linked to Quality Assurance reviews, while for private institutions they are tied closely to admission and graduation figures. All institutions are significantly driven by institutional ranking. Unless determined by these tools, wider impact indicators do not have direct business

relevance to the institutions. This confirms findings in previous studies, that operational areas are driven by the practical fiscal and legislative requirements of the university, requiring senior management support to provide the resources to implement programs (Ralph & Stubbs, 2014).

Finally, several participants have argued that triple-bottom line reporting does not appropriately capture the mission of universities, with a fourth bottom line in terms of academic/research/knowledge impact being proposed as being separate (and more important than) social impact.

This has been a worthwhile and valuable exercise. We should however address its context and limitations. The methodological limitations, such as sample size, are obvious and in that sense the findings are indicative rather than representative, prototyping a proof of concept. There would however seem also to be methodological limitations implicit in having incomplete access to all the necessary data and data-owners. This is not however a merely technical methodological issue but a more subtle issue, a consequence of the inherent nature of large modern bureaucratic organisations where data and responsibility are diffused and compartmentalised. Perfect access to perfect data would never happen because it is not in the nature of the organisations in question.

There are however also what might be called philosophical or epistemological limitations, namely that our tool adopts a reductionist and positivist stance, in that it decomposes the problem domain and looks for objective, preferably numerical, data. It is, in that sense, a product of our times, resonating with the increased managerialism across much of the higher education sector, that needs to see activities, outputs and impacts measured, quantified and tabulated, and resonating with policy makers and the scientism that has informed policy making for perhaps the last century, likewise looking for rational, explicit and objective foundations for policy formulation. Scientism might be called the application of hard science methods to soft social systems. If this context of our tool is recognised, it is not intrinsically a problem but is perhaps an argument for using it alongside more holistic, impressionistic, softer, subjective or experiential methods.

With these limitations in mind, we believe that our work suggests that some elements of triple-bottom line reporting may be used to make the case for a more systematic use of MOOCs, given that these still a niche activity for most institutions. Being able to showcase the cost-benefits of a MOOC programme, and being able to contrast these with those of other learning methodologies may allow MOOC-departments to make a case for expansion and mainstreaming to management. However, taking advantage of this possibility requires departments to create an analytics strategy from the outset, and measurement of it over the years.

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This document examines the possibility of using triple-bottom line reporting to asses the opportunity cost of investing in MOOCs versus other interventions for purposes of employability and social inclusion. It reports on a pilot of such a methodology across four European Higher Education Institutions.

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