



# SCORE2020

Output 9 SCORE2020:  
*Evidence based practice for  
teachers and institutions  
using MOOCs*

September 2016



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**Disclaimer:** This document is produced as part of the European Union-funded project SCORE2020 - Support Centres for Open education and MOOCs in different Regions of Europe 2020. This project supported by the European Commission, DG EAC, under the ERASMUS+ Programme (Ref. 2014-1-NL01-KA203-001309). However, sole responsibility for this report lies with the authors and the Commission is not responsible for any use that may be made of the information contained therein.

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## Introduction

This output aims at providing teachers and institutions with organisational models and tools on how for collecting evidence during design, developments and use of MOOCs.

When designing, and delivering open and online courses, stakeholder (the institution / development team/ professor) has certain aims to realise. Those aims and goals are always related to learning objectives for specific target groups. In addition the faculty and institution has certain purposes with such an course as it can be used to get more (new kind of) students, as a marketing instrument for the institutions, to innovate campus education etc. Moreover at the macro the governments provides support to MOOCs to improve quality of education, to increase access to HE, or to improve the use of new technologies and ICT. At all these levels evidence needs to be collected that those aims and goals (interventions) are realised.

## Unlocking existing evidence and evaluation tools

The partnership tried to unlock various existing evaluation on those micro, meso and macro level. We however, must conclude that not many of those tools are available although many supportive processes are recognised and sometimes operational. Only very few could be disclosed at a public level and are described in this document.

This situation is illustrated by a short description of present situation in Norway and further elaborated on the context and developments in France. In addition a generic evaluation tool used as a pre- and post-test for MOOC participants is described and two tools used at NIDL/DCU.

## No systematic MOOC evaluation in Norway

Only a few if any Norwegian MOOCs have been evaluated or assessed systematically

- On the macro level, courses and programs are audited by the Norwegian Agency for Quality Assurance in Education. MOOCs are usually not courses in this sense of the word, but supplements to or subject matter in a course, and hence are not audited. The auditing of Norwegian Agency for Quality Assurance in Education is the only tool on macro level.
- On the meso level, each HEI has a system for QA. These systems assess the quality of courses and programs, and not perse MOOCs (see output 8). As such some HEIs have systems for assessing the quality of study material developed locally.
- Close to 50% of Norwegian MOOCs have been developed with financial support from (Norwegian Agency for Quality Assurance in Education. They have a system for assessing the success of the project, but not of courses and/or study material developed within the project.

## Evidence-based practice for teachers and institutions using MOOCs in France

Gathering and processing data, whether associated with resources or with their use, presupposes that they are interoperable and reusable. To this aim, the use of **norms** and **standards** becomes essential. To make available and to make the most of resources, it is essential to index them which also allows their copyright to be protected.

The French state desires that all projects be based on quality baselines derived from international norms, as well as fitting into the European dimension. **AFNOR** has been given the missions of translation, adaptation and dissemination of one norm which France would like to see enforced.

Within the framework of **The International Standards Organisation (l'Organisation internationale de normalisation- ISO)**, are approached, amongst other matters, thematics of models for e-Portfolio, quality baselines for skills, and learning analytics. These norms impact on initial and lifelong learning. The **Sup-LOM-fr norm**, an abbreviation of *Learning Object Metadata*, allows the compiling of teaching resource bases and the organisation of their broadcasting.

An example of the use of resources delineated with the help of this norm is the government search engine **sup-numerique.gouv.fr**, the digital gateway of higher education which allows the referencing of open educational resources offered by the **UNTs** and **Canal-U** for audiovisual resources in HE. The exchange and transfer of data may be carried out using the **OAI-PMH (Open Archive Initiative - Protocol for Metadata Harvesting)** protocol. In this way, it is not resources that are exchanged but the meta-data associated with them and which therefore become visible. This protocol is used by a free open-source piece of software, the **Outil de Recherche et d'Indexation Open Archive Initiative (ORI-OAI)**, which supports other indexation formats, such as Dublin Core, LOM or TEF.

Concerning data on the supply of teaching (in the classroom or by distance), higher education establishments, universities, university pooling organisations, the Ministry of Education, Higher Education and Research can take advantage of a French version of the CDM standard: **CDMFR**. This standard is used for indexing and advertising distance courses by the Interuniversity Federation of Distance Learning (**FIED**), harvested from the **sup-numerique.gouv.fr** gateway.

Another emerging norm, **Metadata for Learning Resources MLR (ISO 19788)**, should allow for the description of e-learning resources, taking into account use of the Semantic Web. The resources described, beyond pedagogical resources, include learning and competence delivery.

The data generated by following the traces left by learners allow for the constitution of a corpus on their behaviour. They may be used, amongst other things, for increasing knowledge of the mechanisms of learning, personalising teaching approaches, and helping students. Learning Analytics have as their aim the interlinking between learners and their environments, as much determining or predicting learner behaviour as for the production of reports and management charts.

I think that we should here introduce the name **AFNOR**, which is the support and guarantor of normative aspects.

The problems of normalisation are, equally, at the heart of Learning Analytics. Within the framework of ISO, the Normalisation Commission SC36 Technologies for Education and Learning (la **Commission de normalisation SC36 Technologies pour l'éducation, la formation et l'apprentissage**) is interested in the interoperability of platforms and the data that they produce. The **IMS Project** concerns metrics (forum participation, time spent watching videos, etc.) in such a way that online learning systems generate metrics in the same way as tests, which can then be processed by other tool types.

In the field of Learning Analytics, research projects such as HUBBLE, PERECLES and Attestoodle are supported and funding secured, as is the case of the thesis on 'Minimal Testing in Relation to Evaluation Objectives' at the ENS Cachan.

Tools are developed or under development by research teams in various university laboratories. The **HUman oBServatory Based on anaLysis of e-Learning traces (HUBBLE)**<sup>1</sup> project brings together several French research teams and capitalise on knowledge and skills for constructing and sharing the analysis process of massive e-learning traces. The analysis processes are designed for different decision-making stakeholders: students, lecturers, establishments... They are used to produce model and indicator concepts. The data come from MOOCs (the data coming from FUN-MOOC and Open-Classroom platforms) from educational game platforms and exercises (in medicine in particular). Starting from experimentation, their research project is iterative and the results are delivered over the course of their iterations.

Within the framework of the **Projet pour l'Évaluation et la Recherche Informatisée autour des Compétences dans l'Enseignement Supérieur**<sup>2</sup> (PERICLES), the data used are traces from the UNTs or universities. Their problematics are centred on modelling users or communities of users and the designing of predictive algorithms.

On the one hand, several applications several applications are used to follow traces to track learner pathways: an approach based on the Process Mining of the research arm of the Altran company and another approach based on the follow-up of learning trajectories is carried out at the Lorraine Laboratory for IT Research and its Applications (Laboratoire Lorrain de Recherche en Informatique et ses Applications - LORIA).

On the other hand, recommendations systems are processed. They can take the form of a complementary service housed on the gateway of a UNT, by adapting the systems in place for e-commerce for teaching resources, or may be an integrated service on a teaching platform of a university, delivering to students resources which do not originate from their institution but from suppliers of open educational resources, the UNTs.

The basic principle of the recommendation system is as follows: recommendations are fed by a system which itself constructs them from the student's usage in their own environment and those that other users produce in the UNTs.

At the heart of the **Institute for the Digital Society (l'Institut de la Société Numérique - ISN)** of the **University of Paris-Saclay**, exists an e-education university centre to which the laboratory of **Sciences Techniques Éducation Formation (STEF)** belongs, which studies adaptive learning tests on a massive scale. In this type of test, the questions asked of students depend on the answers they have already given and on their profile. This can be a diagnostic test at the start of a MOOC, a test to determine the learner's level using a minimum of questions to determine a mark with a reasonable interval of confidence, and finally, a test to discover gaps in learning.

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<sup>1</sup> <http://hubblelearn.imag.fr/>

<sup>2</sup> Projet PERICLES : <http://v2.e-pericles.org/>

Student monitoring is at the centre of the **Attestdoodle<sup>3</sup> project**, named from ‘Attestation (≈ certification) Moodle’, supported by the **University of Maine** and the **University of Caen**. This was part of the Call for a General Expression of Interest in 2016 by the Ministry for State Education, Higher Education and Research, to which the FIED lent its support. Its objective is to set up automatic monitoring for trainees throughout their life, which will enable them to certify their learning undertaken over distance. It will offer universities the possibility of instrumenting a solution capable of delivering a collection of monitoring traces which can be used to validate learner pathways on line.

There is always an ethical dimension in taking note of the confidentiality of data and the respect for privacy. Learning data may be public or private and laws differ from one country to another, which hinders exchanges with French or European partners. In France, the spread of Learning Analytics is linked to the restrictions imposed by the National Commission for Data and Freedom (Commission Nationale Informatique et Libertés - CNIL). Data processing indicating behaviour are sensitive and the legal framework may pose a hindrance to technology research and development.

## MOOCKnowledge survey instrument.

### Background

The MOOCKnowledge project was a tender project developed by the European Joint Research Centre *Institute of Prospective Technology Studies* (IPTS) in Sevilla and subcontracted to the Open University of the Netherlands in collaboration with the University Oberta de Catalunya and the Universidad Politécnica de Madrid. The project was conducted between November 2013 and November 2016. During the project runtime, 11 different providers have used the instrument fully or partially for 23 MOOCs resulting in a total dataset of 5862 filled in pre-questionnaires and 1304 post-questionnaires. IPTS has continued the project and is still offering the survey instrument for MOOC providers via the project homepage<sup>4</sup>.

### Focus of the survey instrument

The survey instrument of the MOOCKnowledge instrument measures background variables of participants combined with variables taken from the reasoned action approach and self-determination theory. The table below shows the different parts of pre-questionnaire of the survey instrument.

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<sup>3</sup> Projet Attestoodle: [http://media.sup-numerique.gouv.fr/file/Innovations\\_pedagogiques/99/1/Attestoodle\\_689991.pdf](http://media.sup-numerique.gouv.fr/file/Innovations_pedagogiques/99/1/Attestoodle_689991.pdf)  
<http://www.sup-numerique.gouv.fr/pid33137-cid110133/un-hackathon-pour-concevoir-un-systeme-de-suivi-de-la-formation-en-ligne.html>

<sup>4</sup> <http://moocknowledge.eu>

<b>Chapter 1 – Person Related Information</b>		
	Module 1 – Demographics	Background Variables
	Module 2 – Nationality, Language	Background Variables
	Module 3 - Other Languages	Background Variables
	Module 4 – Socioeconomics (Ex)	Background Variables
	Module 5 – Socioeconomics (S)	Background Variables
<b>Chapter 2 – Learning &amp; Professional Development Activities</b>		
	Module 1 – Prof. Development	Background Variables
	Module 2 – Awareness of MOOC	Background Variables
	Module 3 – Previous experience	Background Variables
	Module 4 – Support Prof. Act.	Background Variables
	Module 5 – Satisfaction MOOCs	Background Variables
	Module 6 – Goals & Completion	Background Variables
<b>Chapter 3 – Motivational Variables – Self Determination Needs</b>		
	Module 1 – Basic Needs Satisfy	Basic Psychological Needs Scale
	Module 2 – Locus of Causality	Perceived Locus of Causality
<b>Chapter 4 – Distal Variable – Social Influence</b>		
	Module 1 – Descriptive Norm	Reasoned Action Approach
<b>Chapter 5 – Outcome Beliefs &amp; Their Evaluations</b>		
	Module 1 – Outcome Beliefs	Reasoned Action Approach
	Module 2 – Evaluations	Reasoned Action Approach
<b>Chapter 6 – Normative Beliefs &amp; Motivation to Comply</b>		
	Module 1 – Normative Beliefs	Reasoned Action Approach
	Module 2 – Motivation to Comply	Reasoned Action Approach
<b>Chapter 7 – Control Beliefs &amp; Power of Control</b>		
	Module 1 – Control Beliefs	Reasoned Action Approach
	Module 2 – Power of Control	Reasoned Action Approach
<b>Chapter 8 – Proximal Variables: Perceived Behavioral Control</b>		
	Module 1 – PBC	Reasoned Action Approach
<b>Chapter 9 – Proximal Variables: Attitude, Social Pressure &amp; Intention</b>		
	Module 1 – Attitudes	Reasoned Action Approach
	Module 2 – Social Pressure	Reasoned Action Approach
	Module 3 – Intention	Reasoned Action Approach
<b>Chapter 10 – Intention Behavior Gap</b>		
	Module 1 – Planning Intentions	Reasoned Action Approach
<b>Chapter 11 – Student Interaction</b>		
	Module 1 – Interaction	Reasoned Action Approach
	Module 2 - ICT Skills	



## Experiences with the survey instrument

In the pilot phase of the project the full survey-instrument was used for each MOOC. This led on the one hand to problems with regard to time needed by participants, on the other hand providers communicated that they would need a more flexible survey instrument. To combine the aspects of flexibility and comparability the project members have developed a templating approach in which a basic set of questions was added to each questionnaire and additional modules could be added depending on the research interest and need of the providers.

## Student-facing Evaluation Tools for Open and Online Learning

The National Institute for Digital Learning (NIDL) at Dublin City University (DCU) has developed the following two unique student-facing tools for monitoring and evaluating the value, benefits and long-term impact of new models of Open and Online Education, including MOOCs.

### Tool 1 – Are You Ready for Study?

This tool builds on the principles of self-regulation and self-assessment by inviting learners to reflect on their level readiness to be successful as an online student. The tool either embedded in a MOOC or used as a standalone resource involves a series of 20 self-reflective questions which each provide personalised feedback depending on the response (see Figure 1).

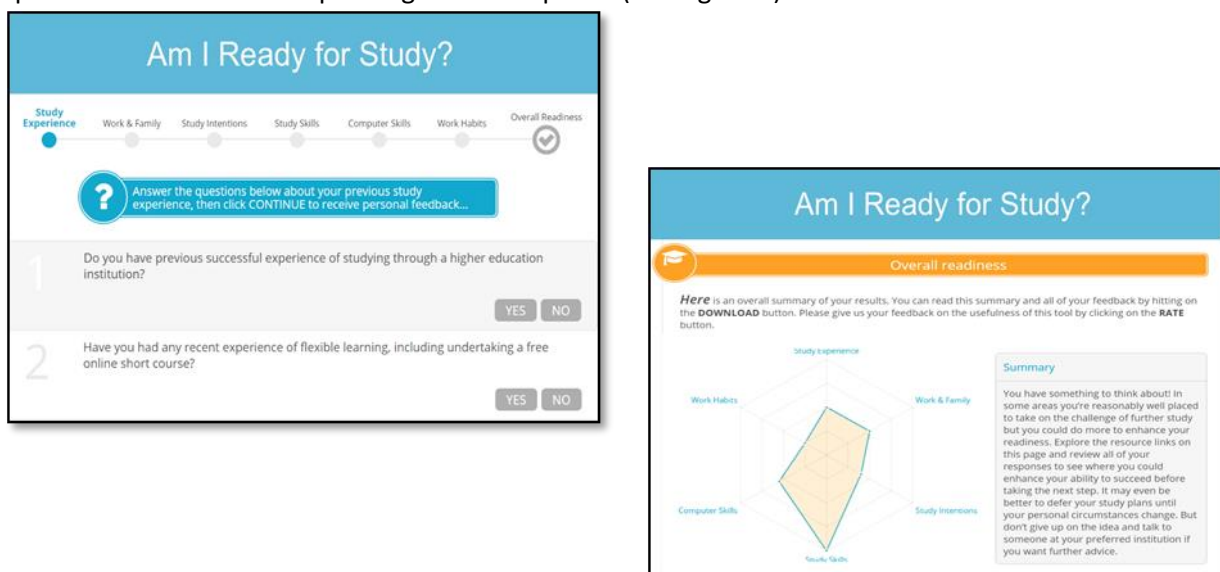


Figure 1: Example of Am I Ready for Study

It also offers a consolidated summary of the responses with personalised feedback on the learners' overall chances of successful completion given their particular circumstances. Notably, the tool is freely available for other institutions to use and customise as they deem appropriate for different target groups and has been lodged in a commercial Creative Commons Licence to encourage the widest possible uptake. A working example of the tool is available from the following website:


<http://studentsuccess.ie/toolbox/tool1/#/>

## Tool 2 – What are your goals?

This tool once again builds on the principles of self-regulation and self-assessment by inviting learners to reflect on their level goals for the completion of an online course, including MOOCs, before they get underway. The tool, ideally be embedded in the course design at an early stage of the study lifecycle, operationalizes the literature on learning personas, by recognising that different learners will have different goals for completing the course (see Figure 2).


**Question 1**

Not yet answered   Marked out of 1   [Flag question](#)   [Edit question](#)



As far as deciding on studying, or not, and what subject to study, I  What I most want from this five week course is for it to

In terms of any previous experience with this kind of endeavour I  previously studied at higher education level (college, university, etc.).



There are  time consuming areas in my life that I will need to manage along with my studies. In terms of the 'big two', work and family, I  and . Also about me: I identify my gender as  and my age is in the  range.

Figure 2: Example of What Are Your Goals Tool

The purpose of the tool is twofold:

- (i) to help learners reflect on and articulate their individual learning goals, and
- (ii) to support a deeper level of evaluation of course completion and student success data based on the known influence of initial learning goals and study orchestrations.

A unique and distinguishing feature of the tool is the use of a number of drop down scenarios for the learner to select from rather than asking for highly personal information, which may be off-putting at the start of a course. These options are grounded in the literature on known student demographics and specific study orchestrations, thereby providing more authentic and validated data for evaluating different learning journeys and definitions of student success.



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