

A MOOC Platform for Training of Construction Professionals in France

C. Nirup, Auteur¹, F. Godefroy, Auteur¹, S. Verhaeghe, Auteur², R. Lafaye, Auteur³

¹ French Environment & Energy Management Agency, 49 000 Angers, France

² French National Council of Architects, 75 000 Paris, France

³ CIMEOS, Bourgogne-Franche-Comté University, 21 000 Dijon, France

Abstract :

The “MOOC Bâtiment Durable” platform is a collective project to mobilize the construction sector in France, to train professionals on topics with high stakes such as energy refurbishment. This article explains the genesis of the project, the operation of the platform, the main results and perspectives.

The project is founded on a relationship of trust between the actors of vocational training in the construction sector. Since 2007, professional organizations and public authorities have worked together on training schemes related to energy efficiency of buildings. In 2015, ADEME and the Plan Bâtiment Durable launched a feasibility study of a MOOC platform on the construction theme, involving the sector stakeholders.

For the partners it was important to distinguish this vocational MOOC platform from academic approaches, while keeping high-level quality and a specific visibility. So a dedicated platform was created and firsts projects were supported financially and technically.

Since Jan 2017, 36,600 persons have created an account on the platform, representing 65,500 learners, 60% of whom are construction professionals. The average success rate is 23%. According to the feedback from the learnings, the proposed MOOCs respond to various needs and they can be part of the training obligation of professionals, such as architects.

The platform continues its development offering SPOC and blended-learning courses. In addition, a survey of registered individuals has identified areas for improvement i.e. in the communication or targeting of MOOCs.

Keywords: Vocational training, Construction sector, Partnership, MOOC

1 Genesis of the project: building trust between partners

1.1 First collaborations of professional organizations and public institutions to develop sustainable building training

The “MOOC Bâtiment Durable” is a partnership initiative that has its roots in the FEE Bat¹ program launched in 2007. This program aimed to train 120,000 people in the building sector to improve the energy efficiency of buildings. Co-financed by a public funding (Energy Saving Certificates), it brought together the professional building federations, public institutions such as the Ministry of Ecology and ADEME². Together, these actors have designed training courses for companies and craftsmen on the one hand, engineers, architects and project managers on the other, and set up the dissemination plan in France. Today, 177,500 persons have been trained through this system. The implementation of the program has made it possible to build a first base of trust between these actors; institutions and professional organizations.

In 2011, the European Commission launched the "Build Up Skills" project. Its main objective was the elaboration of a roadmap, country by country, actions to be implemented until 2020, to reinforce the skills of construction site professionals in the field of energy efficiency and renewable energies, but also job-seekers in the building sector. The project also aimed to strengthen the dialogue between the different stakeholders of the sector, through a participative and partnership approach. A consultation was set up at the national level, as at the regional level, which allowed the participation of all the stakeholders interested in drafting the roadmap, which was published end of 2013³. ADEME was one of the initiators of the project in France, in connection with the structures of employment, vocational training and technical experts in the field of construction. The work highlighted the importance of digitizing part of the training offer, but without providing concrete solutions. The professional federations, and more particularly their training entities, took an active part in the work. On the organizational level the "Build Up Skills" project added a brick in this construction of trust between actors of professional training in the building.

1.2 The value of digitizing part of the training offer

In July 2014, the report "Rénovation Energétique et Filière du Bâtiment"⁴ is published. Written by Sabine Basili, vice-president of CAPEB (Confederation of Building Craftsmen) and Ingrid Nappi-Choulet, professor-researcher at ESSEC Business School, it presents the result of a working group set up by the Plan Bâtiment

¹ Training device for professionals to save energy in the building

² French Environment & Energy Management Agency

³ Roadmap Build Up Skills France 2013

⁴ « Rénovation Energétique et Filière du Bâtiment » Basili, Nappi-Choulet, juillet 2014, p 34

Durable⁵. It stressed the importance of developing MOOC-type online training for building professionals.

Following this, ADEME and the Plan Bâtiment Durable launched a study on the opportunity to move further. They reached out to the structures already involved in Build Up Skills, and also training organizations, funding bodies for vocational training, associations, consulting firms and other organizations and trade unions interested in the subject. The work made it possible to identify common objectives, the scope of the MOOCs, the technical solutions for a specific platform, and also possible modes of governance. In early 2015, a one-day MOOCCamp was organized with about fifty participants. This work led to the conclusion that a MOOC platform, specifically dedicated to this sector, was an opportunity to boost the skills of professionals on the topics of sustainable building (efficient refurbishment, energy efficiency, etc.). The progress of this feasibility study was published progressively on the Construction 21⁶ site so that all those who wished to could contribute.

The creation of the "MOOC Bâtiment Durable" platform is therefore the concretisation of the shared reflections of the building stakeholders to meet the needs of professionals to increase their skills on environmental issues.

2 The operation of the platform

The implementation of the platform and the development of the training offer are based on a dedicated Open edX platform, open governance and financial and technical support from the public authorities.

2.1 A dedicated Open edX platform

The desire to have a quality offer, visible and distinguished from the academic approaches, led ADEME to ensure the operational support to the development of an ad hoc platform. After a comparative study between the MOOC platforms available in 2015, the choice fell on the open EdX platform of France Université Numérique⁷. One of the advantages identified was the evolutionary aspect of the open source solution on which it is based.

As a public institution, ADEME was able to join and become a founding member of the Fun-MOOC GIP. As a member, ADEME benefited from the development of a

⁵ Plan Bâtiment Durable (Sustainable Building Plan) is attached to the Ministry of the Environment and federates the building and real estate stakeholders around ambitious goals of energy efficiency and environmental building

⁶ Construction 21 is a social media dedicated to all professionals active in the sustainable building and city sector

⁷ France Université Numérique is the main platform of MOOC in France, created at the initiative of Ministry of higher education and research

white label platform dedicated to "sustainable building MOOCs". It was set up in 2016 and opened in November 2016.

2.2 A collective governance

In order to maintain the spirit of dialogue between the partners, an open mode of governance was organized, under the aegis of ADEME and the Plan Bâtiment Durable. A governance charter was drafted by the two structures and signed on 30 November 2016 by some 20 structures (professional federations, training organizations, technical organizations, public bodies). To date, 32 structures have signed the charter. The signatories play an active role in the selection of the MOOCs hosted on the platform, by evaluating the proposed projects while making sure to look for complementarity between the different MOOCs. They also contribute to the communication around the MOOCs and are proactive regarding the evolutions to bring to the platform. These different topics are dealt with in 2 to 3 annual meetings bringing together the representatives of the signatory organizations, with the animation of the ADEME and Plan Bâtiment Durable.

2.3 Financial and technical support for the development of the first MOOCs

In 2015, the government made available significant funds to develop, among other things, training activities related to the energy transition and the digital transition in the construction sector. One of the calls for projects included MOOCs as a training action eligible for funding. Thus, a dozen MOOCs have obtained at least 55% of public funding (usually up to 80% when co-financed by other public funds from ADEME or local authorities such as the Regions).

In addition to these grants, technical support is offered to MOOC project-carrying organizations. Indeed, the projects are mainly supported by structures associating a training organization and consultants, energy renovation experts but unexperimented in MOOC. Thus, in order to guarantee the quality of the online training offered, ADEME has commissioned a digital learning agency to support the teams. This support consists of 1 to 2 days of group and individual advice, from the design to the appraisal of the sessions of each MOOC. It allows addressing pedagogical and technical aspects, as well as the specificities of the platform open EdX. Finally, the proposed support allows project leaders to meet each other and facilitates the search for complementarity between the MOOCs and their association, by target or subject, during the programming sessions. The opening of the MOOCs is organized by groups of 3 to 7 MOOCs with a programming taking into account the progress of the projects but also the proposed topics.

3 The main results

3.1 Quantitative results

Between January 2017 and the end of February 2019, 18 MOOCs were created and 30 sessions opened (see attached Table 1), representing 65,500 learners (registered in a MOOC). To date, 36,600 people have an account on the platform, 60% of whom are building professionals. Among this category, architects, engineers, construction economists, are the most represented.

Figure 1. Graphical representation of the professionals registered



In terms of enrollment, there are three categories of MOOC:

- MOOC "generalist": more than 3,000 participants, on topics of general interest for building professionals, for example the MOOC "Efficient refurbishment"
- MOOC on a specific subject: 1,500 to 2,500 participants, such as the MOOC on passive building
- MOOC on a specific subject addressed to a particular group: between 500 and 1 400 participants, such as MOOCs on energy refurbishment of social housing for asset managers or operations managers

Certificates of successful completion of MOOCs are delivered on the platform, with success thresholds generally between 50 and 70%. The success rates of the different MOOCs are between 15 and 30%, with an average and median rate of 23%. To date, 15,400 trainees have obtained a certificate on MOOC Bâtiment Durable.

3.2 Quality assessment

At the end of each MOOC the learners answer a questionnaire which show overall satisfaction with the operation of the platform, the MOOC modality, and the pedagogical contents proposed. Nevertheless, these results are to be moderated since most respondents are those who completed the MOOC as a whole, and therefore found an interest.

In addition, a survey of individuals registered in the platform was conducted in November 2018. Given the low number of respondents (464 to 531 people or 1.6%

and 1.8% of registered individuals), it is considered exploratory. Through the numerous comments, elements of appreciation of the platform and the MOOCs nevertheless emerged from it, as well as suggestions of improvement. In particular, learners appreciated MOOCs being designed with professionals for professionals. The content of the MOOCs, made of concrete, practical elements, supplemented by practical cases or case studies, are also important elements. The quality of the speakers, especially recognized experts is also an important factor.

The MOOCs on the platform meet a variety of needs. For example, teachers agree to the reuse of the content offered as part of their training. In addition, one profession – architects - has been particularly committed to the platform. The MOOCs are a mandatory part of their training, in a category called "complementary", decided by the CNOA⁸. Finally, completing a MOOC may be a differentiating factor for job seekers in the building sector, as some of the respondents to the survey testified.

4 The perspectives

The platform continues its development, including new MOOCs and also changes in its way of operating and the proposed offer.

First of all, the question of the recognition and financing of this pedagogical modality is part of a context of reform of vocational training in France. The "Law for the freedom to choose one's professional future" was promulgated on September 5, 2018. It profoundly transforms learning, unemployment insurance and vocational training. A new definition of the training action appears: "The training action [...] is defined as a pedagogical pathway to achieve a professional goal. It can be performed in whole or in part at a distance. It can also be done in a work situation." This law and the decrees that stem from it should make it possible to better integrate distance learning methods, including MOOCs and SPOCs.

In addition, experiments in SPOC and blended-learning courses have been implemented on the platform since 2017. The aim here is to best meet the needs of professional, with more customization and practice in training.

Another issue is at the level of governance. Working collectively between the stakeholders has largely contributed to the success of the platform. The various members, whose professional organizations have a good knowledge of the training needs, favor a relevant selection of training to be offered on the platform. Nevertheless, not all signatories are active in governance. In addition, the arrival of SPOC or blended and the new set of actors in the context of the reform, could lead to changes in the organization in place, and stakeholders to mobilize.

⁸ French National Council of Architects

Finally, the last issue is communication. With more than a million professionals working in the building sector, the margin of progression of the number of registered learners on the platform is gigantic! Some categories are also poorly represented, such as real estate professionals or teachers and trainers, who remain to be conquered. With this latter category, the reuse of content produced in MOOCs could be widely promoted and developed. In addition, a majority of users of the platform have only registered for one MOOC, which should lead us to think of ways to attract these registered learners to new topics on MOOC Bâtiment Durable.

Annex

Table 1. List of MOOCs created and disseminated

Successful renovation - the keys to energy rehabilitation (3 sessions)
A method for successful operations and renovation projects (1 session)
Prescribe and estimate at BIM time (2 sessions)
Passive building and low carbon: the global approach by BIM (3 sessions)
Proximity and Rental Management in social housing: accompany and raise awareness about energy management (2 sessions)
Project Management and Maintenance in social housing: Improving Energy Performance, Retrofitted and New Buildings (2 sessions)
Inhabitants in social housing: Optimize comfort and consume better! (2 sessions)
Hemp construction (1 session)
MOOC BIM: Become a player in the transition (2 sessions)
Sustainable construction in humid tropical Zone (2 sessions)
All about E + C experimentation (2 sessions)
Boiler optimization: design - regulation - management (2 sessions)
BIOMOOC: Discover the bio-based construction (1 session)
Renovate with the BIM the detached house (1 session)
Build: technical, legal and commercial challenges (1 session)
CAPECOBAT: energy renovation in social housing (1 session)
Energy poverty - Understanding and acting (1 session)