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EARTH GOES EUROPE

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ABSTRACT

Earth material has numerous advantages when it comes to reducing environmental impacts in the building sector, but its use remains limited as few professionals are trained : very few formal trainings exist at european level.

European earth-building training projects were undertaken during the last years to open the way for the official recognition of earth-building's skills and knowledge. This is an essential part of the effort to wide-spread the use of earth in the building sector.

This paper intends to stress the interests of assessment to get earth construction recognized and introduced in current construction trainings at all levels, and to recognize learning outcomes to deliver certificates.

Firstly, the concepts of assessment criteria and units of learning outcomes, part of the ECVET framework (European Credit system for Vocational and Educational Training) will be described through example of previous experiences in european earth-building training.

In a second part, the development of this experience acquired with projects dealing with clay plasters will be presented : the PIRATE (Provide Instructions and Recommendations for the Assessment and Training in Earth-building) project aims to build with 18 european partners the foundations of european earth masonry and supervision trainings by proposing assessment criteria and defining units of learning outcomes able to integrate existing curricula.

Finally, the current progress of this project will open to questions about the opportunities and issues encountered so far.

Key words

Earth-building, training, ECVET, assessment, learning outcomes

INTRODUCTION

Earth as a building material has a very good potential for continuing its growth : more and more people, builders, architects are trying to use rammed earth, cob, adobe or other earth based building techniques for their projects. Although it's a poor insulation material when used for massive walls, earth has excellent thermal and humidity regulation properties. It's also able to bear loads for relatively small structures. One aspect that is paramount in the current low-energy buildings' path is the embodied energy, and earth has also an excellent potential in this respect : raw earth needs almost no transformation (sometimes none at all), so that it's carbon footprint comes either from transportation or from additives sometimes used, such as lime or cement. Local non-stabilized earth is in this respect a champion amongst low-embodied energy materials.

However, using earth for construction isn't as ground-breaking as one might think: a large part of the old buildings in europe are built with earth. In some places it counts for up to 50 % of the existing housing stock. These buildings are made following many earth building techniques: rammed earth, cob, adobe, wattle&daub, plasters, thus providing a heritage of an exceptional richness with various locally specific earthen architectures, know-how and knowledges. Unfortunately these know-how and knowledges have been largely moved aside by the development of modern materials, leading to a progressive degradation of the architectures.

This heritage is still a distinctive feature of the landscape in several areas, as well as an important part of the housing stock. More than old buildings, it can be considered as a significant part of the cultural heritage.

Quite a lot of trainings are offered throughout Europe, but apart very few, they're not providing formal qualification. That situation leads to a shortage of qualified skilled workers since years. However, VET providers and other training organizations are more and more demanding of contents to address a growing "respectful retrofitting" demand. The maintenance market is therefore often trusted by conventional professionals, leading to decreasing patrimonial values of the overall stock and frequent defects.

This lack of qualifying trainings impacts the new constructions' market as well, one of the main issue for building with earth being today to find a skilled worker.

Much of the earthen works are today achieved by highly motivated individuals, whose recognition by the legal and regulatory frameworks mainly comes from a long experience in building with earth, whenever they have it. Many other people, including conventionally trained professionals, also have skills either because they've been working on earthen heritage or because they've had some informal training about earth construction. It is essential, to increase the earth building competent labour, to take into account all these personal experiences and build upon them to upgrade to the required skills and knowledges of the earth-builder.

EARTH GOES EUROPE

This lack of trained labour in earth building is known since years. European training projects for earth building were initiated in 2002 and already mentioned it as a primary reason for their setting up. The European pilot project Modern Earth Building for Promoting Regional Development aimed at closing the gap in available trainings for the application and use of earth&clay based materials. This first project gathered 14 partners from 6 countries to develop a vocational training Unit Clay Plaster and Design. The european dimension of this project and the following allowed to retain the variety of the existing lively earth building culture. Contradicting the idea that scaling up would standardize to the excess, the european consortium allowed to design results that reflects and promote that variety.

This project started shortly after the emergence of ECVET as part of the european process for vocational and educational training harmonization (Copenhagen process, 2002). It was therefore difficult to have a clear vision for a European earth building vocational training at the time. The reasons for going europe at this stage were essentially to share the experiences from different european countries and scale-up the individual efforts to promote the utilization of earth as building material. It revealed the vision of European earth-builders familiar with European practices and who are networking with other earth-builders all over Europe. That first project also included the will to recognize non-formal training, e.g. self-taught specialists, who have gained experience in earth building without having gained an officially recognized certificate.

This initiating project was coordinated by FAL e.V and included partners from Bulgaria, France, Germany, Greece, Poland and UK. The project resulted in a training unit composed of 3 modules : basic knowledge, design, marketing. The content of these modules was made available in the partner's different languages. That first project was quickly followed by mobility projects and transfer of innovation projects, so as to test this training material and make it available to more european partners/languages. It is today available in 9 languages : German, English, French, Czech, Slovak, Slovene, Bulgarian, Greek, Polish. Translation into Finnish, Swedish and Estonian and Italian language are underway.

RECOGNIZING LEARNING OUTCOMES

The development of this training material was an important step in the mutual work of the European partners but left a gap : how to ensure people coming from another European country to learn earth building would get a recognition of the training they received when back home or when moving to another country ?

Promoting mobility for learning has been from the beginning of the works on European earth building an objective, for the sake of discovering another place as well as because it gives learning another dimension. Craftsmen in the Middle Ages learnt their trades by traveling for several years to various construction sites, so as to build up their skills and knowledges on a variety of situations. This mobility of craftspeople reinforced exchanges and fed the evolutions of the arts of building. The Gothic churches are a powerful example of the excellence such practices led to. Learning in different places is still active today, especially for the so-called “natural” building techniques such as the ones involving earth : few formal trainings exist and people involved in these practices value experience through informal exchanges and discovery, so that many people are learning by traveling around and building networks as well as buildings.

However, their experience is usually not recognized. As for the experienced conventional builder who might have some skills, knowledge and competencies in various trades related to the art of building, natural building travelers would need a way to transfer their achievements from one place to another and to be recognized according to these achievements. And as the professional paths are very changing nowadays, these achievements should also be transferable from and to non-construction sectors.

Enabling the transfer of the learners achievements from one learning environment to another is a core concept of the European Qualification Framework (EQF). This tool aims at providing a trans-national reference to help “translating” these achievements from a learning system into another, thus easing the mobility of the learners whether it is between different countries or between different Vocational and Educational Training (VET) systems.

The division of the trainings into small units can ease the setup of several journeys in someone's learning path : smaller units can be learnt and validated in a shorter time, therefore in different places. The time spent and achievements made in different contexts are therefore counting for a qualification. Small units also make it possible for more people to enrich their curriculum : qualifications composed of several and identified shorter units means it is possible to organize in several shorter learning times. This can ease the access in a life-long learning context, e.g. for people still employed who have limited time and who might not need to learn the whole set of units. Furthermore, as the objectives are more limited than for a full qualification, people will less likely lose their motivation while earning proofs of their achievements. These achievements will be smaller but they might nonetheless improve their employment prospects and be gratifying, especially if a certificate of achievement is delivered.

However, these achievements can be questioned if an agreement is not made between the organizations where the learner will spend time as a learner or as a professional. Certificates can lose their value, as well as the satisfaction and the motivation of the learner can drop. It is essential for a learner to be able to monitor his/her progress in a stable framework to gain in self-confidence with each achievement successfully validated, no matter the level of qualification. In a mobility context, the framework has to be trans-national to allow visibility and insurance that the achievements can be transferred between learning locations.

Such transfers require that the involved organizations trust each other for granting a learner his/her achievements and validating them. Both have to know what they're talking about exactly when they allow the transfer of what a learner achieved in one context to another. An

agreement is needed between the training organizations about how the units are defined, what their content is and how to assess the learner's achievements. As the VET situation is different in each country, a "common language" has to be used to allow recognition of achievement, hence transfers between countries. The European Qualification Framework (EQF) answers that need of a reference point for trans-national exchanges, at the European level. It is associated to ECVET (European Credit System for Vocational Education and Training) for the fields of Vocational and Educational Training. ECVET aims to make vocational qualifications more transparent, accessible and easily translatable across Europe. It is the Vocational and Educational twin of the Higher Education ECTS.

The concept of learning outcomes is fundamental within that framework : It refers to what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes are often mixed up with learning objectives, which refers to what the trainer intends to cover during the learning process. Switching from the second to the first implies to give the learner a central position in the teaching/learning process. As different teaching cultures exist in european countries, the change in mindset implied by adopting the learning outcomes can be a long and impeding process for an efficient implementation of a European-wide mobility in VET.

Learning outcomes are a common base to define qualifications, design curricula and design assessment. They're as bricks to build trainings and make provisions for them to be recognized in other places. Their use helps strengthening the accountability of qualifications by providing clear content and clear value for it.

Units of learning outcomes arise from the combination of small units and learning outcomes : they are the smallest assessable and transferable package of learning outcomes for a field of vocational activity.

The concept of units of learning outcomes gives a way to split the existing qualifications into smaller modules that are clearly defined in terms of expectations from the learner.

GETTING EARTH-BUILDING TRAINING RECOGNIZED

Building on this framework, a new european earth building project, LearnWithClay, developed the "ECVET Earth Building" framework to make qualifications within the earth building sector transparent and comparable. This project aimed at encouraging trainees to travel to learn, in a form of renewed companionship, and to acquire knowledge, skills and competencies in earth building at qualified educational establishments. This framework is a first step towards introducing earth construction into the existing construction training, at all levels. It provides a way to organize the specific skills, knowledges and competences of earth building and opens trails for further development of units of learning outcomes. It is also a tool to help incorporating selected individual ECVET Earth Building Units into new or existing qualifications, wether in the sustainable building sector or in the conventional building sector.

LearnWithClay started in 2007 with 12 organizations and designed 6 units for Clay Plasters for EQF levels 1 to 4 (basic to average levels), integrated to this framework. The previous projects were designing training material for Clay Plaster, focusing on the learning process. LearnWithClay switched to a learning outcomes approach, independent of the learning context, to make qualifications compatible with the ECVET framework and thus opens the way to trans-national mobility and lifelong learning.

ECVET Earth Building											
sector	Earth wall construction	Rammed earth construction	Wet earth techniques	Dry earth constructions	Restoration of earth construction elements	Clay plaster			Designing with clay plaster	Business management	
level						1	2	3	4	5	6
1						1	2	3	4	5	
2						1	2	3	4	5	
3						1	2	3	4	5	6
4						1	2	3	4	5	6
5											
6											
7											
8											

Units designed
 Units, which form the qualification "Designer in clay plastering" (DE)
 Units possible

Pict. 1 ECVET Earth Building matrix of units

The project resulted in 3 handbooks, directed towards those responsible for education and towards instructors in earth building. These handbooks compile learning units descriptions as well as supporting documents for the determination and evaluation of learning outcomes and for the application in mobility. Background information about EQF and earth building in vocational training is also included.

The various national VET systems in the European countries aren't standardized according to EQF and ECVET yet. Their differences hinder the recognition of units designed according to the ECVET framework and it has not been possible to integrate the results of that project into national VET systems. Therefore, the partners have concluded a mutual agreement to recognize amongst themselves the units and certificates delivered following the project recommendations. This agreement was a way to allow the use of LearnWithClay in Europe until the deployment of ECVET principles in the qualification frameworks of the partner countries. A Memorandum of Understanding (LearnWithClay) was agreed upon and written by the partners to ensure the assessment procedure is transparent. This document guarantees that the achievements of the learner will be recognized by all those who signed it. Organizations who were not part of the project can join LearnWithClay and extend the recognition of the delivered units by signing that MoU. It has been signed by 14 partners from 7 countries. Since 2009, more than 250 ECVET certificates have been delivered for clay plaster units.

A partnership project (2010-2012) has allowed deepening the assessment methods and development of an additional part to the ECVET Earth Building manual: A guide for assessment organizers. That guide gives complete information on how to ensure recognition of learning outcomes in the clay plastering sector.

Assessment of outcomes is indeed essential to ensure trust between partners who account one for the other when they validate a qualification granted by another partner. Years of exchanges and visits established mutual trust between LearnWithClay partners. The Memorandum of Understanding is merely a formalization of it, providing jointly defined procedure and quality standards for the assessment. However, it's difficult to keep trust in all partners of a growing consortium without clear assessment procedures. A good quality of assessment procedures has also to be ensured so as to get competent authorities of the involved countries to recognize the proposed qualifications : such a recognition would considerably scale up the spread of qualified labour on the European market.

Ensuring assessment quality is about providing procedures that are understandable by all the expected stakeholders and adapted to the vocational field and level, while remaining straightforward. Documentation of the assessment is fundamental : the translation into the national systems or the recognition of the assessed achievements might be possible only if sufficient information is recorded and made available following the assessment.

Several tools can help to reach these goals such as LearnWithClay assessment grid which was improved during the 2010-2012 partnership project. The grid has to be simple to fill in by the assessor, it can ease both documentation and quality assurance as all assessors will have the same reference by using it. Properly defined assessment criteria however remain at the core of the assessment quality. They're based on the learning outcomes and determine the performance expected from learners, either with a threshold or with a grade system to be used for several levels. Assessment criteria will reflect what a learner is supposed to know and what s/he is supposed to be able to do at a given level.

THE PIRATE PROJECT

A matrix of ECVET Earth Building Units was initially developed and included other trades and techniques of earth building beside Clay Plaster units. Developing further units for other techniques and trades was thought as a potential future development, so as to fill in this matrix. It was decided at the end of the 2010-2012 partnership project to propose a 3 years long Development of Innovation project to create a part of those new units, focusing on their critical part for recognition : the assessment criteria. Structural earth building techniques seemed the logical continuation of the clay plaster's units and were therefore chosen.

The PIRATE project started in autumn 2012 after the proposal was accepted. It aims at producing assessment criteria for :

- Monolithic earthen walls building techniques (rammed earth, cob) ;
- Earthen blocks masonry walls building techniques (adobe, Compressed Earth Blocks) ;
- Site supervision for earth building worksites.

The development of the new units is expected to help the emergence of trained professionals in construction, maintenance and repair of earth buildings throughout Europe. The project was initiated with the idea of providing tools to integrate earth building specific trades&crafts in existing curricula through the construction of a series of units of learning outcomes and the definition of their assessment criteria. That approach is also expected to enable certification from competent bodies in some countries and therefore facilitate the evolution of the national and regional building sectors towards an increased use and consideration of earth as a building material.



Pict. 2 PIRATE project meetings

PIRATE project gather professionals of the building sector, of vocational training and of higher education from 8 european countries. The 18 partners of the project bring together complementary competences into the project :

- SME and professional associations have a precise knowledge of the concerned trades (mason, site manager). They're able to describe the competences to teach ;
- Vocational training centers are used to develop the means to assess taught competences ;
- Higher education organizations bring theoretical competences on juridic, technical, financial and organizational aspects.

Most of them had already participated to one or more of the previous projects.

PIRATE is currently at the middle of the project's allocated time. Following the planned schedule, the partners have already been defining several units with assessment criteria for the 3 trades selected for the project : monolithic masonry (EQF 3 and 4), blocks masonry (EQF 3 and 4) and site supervision (EQF 5 and 6).

These units were assembled by workgroups composed of competent organizations for the considered trade. Each workgroup met twice, each meeting held in a different location. This "live" work was completed by many web-conferences and distance working through an online collaboration platform especially developed.

Already many organizations such as universities, colleges, companies are involved in earth building, but as it's not their primary activity it often remains hardly visible. However, these people also have their word to say in what a series of units for earth building has to be, that's why experienced local earth builders' meetings were organized in most of the participating countries. Following an iterative process, these discussions were included into the thematic workgroups, the results of which were sent back to the local builders for comment. Such a process ensures a proper understanding between all the stakeholders, including representatives of the public targeted by the project : the building professionals. It also makes provision for a further recognition of the results and provides a network on which to base the evolution process of the training standards being developed.

That overall process of defining the learning outcomes assessment criteria for some earth building trades resulted in numerous earth-builders meetings throughout Europe. As draft criteria are upon completion for each of the selected vocational field, a testing phase is about to begin. The project provides a base for developing training programs, setting up job descriptions, and might help establishing norms and guidelines.

Dissemination will also grow to share the results already obtained and keep reinforcing the existing network. It is an essential part of the project also to ensure the labour market prepares job opportunities for the future trained professionals : more and more stakeholders of the building process are interested in using natural materials and the project outcomes will provide them useful resources to get competent workers and push their ideas forward. That need of dissemination was included from the very beginning of the project : the large number of partners involved aimed at facilitating it. The size of the consortium, the forerunner character of the partners, their grounding in the existing national and international networks is clearly an advantage for the dissemination and exploitation of the expected results. A public website serves as a portal specifically for the project, newsletters are published regularly and accessible from it (pirate.greenbuildingtraining.eu/). Finally, a booklet is planned for the next months, to share the intermediate results of the project.

CONCLUSION

The development of a european framework for earth building training is since years recognized as an asset for the development of a european community of earth builders and for its economic development.

PIRATE project follows that useful and productive European cooperation. The diversity of traditional earth building techniques in Europe has led regionally to original modern adaptations. Through establishing platforms for exchange, a European approach allows sharing the various initiatives and progress made that helps to reach more efficiency in the earth-builders practice. The combination of various constraints and related experiences allows to develop better and stronger argumentations and strategies.

However, the variety of educational systems, teaching contexts and assessment methods among the countries is a challenge for the elaboration of common qualifications that can be used in different places, transferred, and accumulated. PIRATE project also questions the fact that most of the previous results entering vocational schools were the fact of committed trainers who found intelligent ways to integrate earth as a building material into the training scheme. In this respect, wether the initial idea of proposing independent units to incorporate to existing trainings was realistic still remains open.

In the meantime, the development of LearnWithClay methodological framework will continue with an erasmus+ project under the lead of FAL e.V. That new project aims at developing a methodology for the assessment of existing individual competencies in Earth Building : another step towards the wide recognition of earth workers' various skills and knowledges and of earth as a building material.

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