Chemlab: Road shows, accompanied with workshops in Germany (TUM), have been initiated in the partner countries Greece (AUTH), Georgia (TSU), Poland (AMU), and Turkey (GYTE) with the aim to establish a European apprenticeship training for chemical laboratory technicians. The idea of a dual education (both on-the-job and in school) is in order to satisfy the European wide demands for highly skilled workforce in the chemical industry sector.

In 2009, a project named Chemlab started with the primary rational that there is a need for highly skilled workforce in the European chemical analytical industry sector. The idea was to figure out a realization of training and education for graduates to become a European certified Chemical Laboratory Technician (CLT). As a result from a successful application within the framework of Leonardo Da Vinci Partnership program, several workshops at the Competence Pool Weihenstephan, TUM, Germany, and a road show have been initiated in each partner country.

While topics of analytical chemistry (analytical instrumentation and water treatment) were treated in two workshops (held at TUM for young scientists and experienced teachers arriving from these countries), the purpose of the road show was to locally figure out the status and possibility of establishing dual vocational educational training (VET) for chemical laboratory technicians (with analytical focus). Dual VET such as in Germany is well known for its efficiency to train and educate young graduates on the job. Therefore, representatives from TUM and IHK Munich visited partners from universities and met with company stakeholders and other representatives who came from educational ministries, chambers of foreign trade and chambers of commerce, acting within the chemical industry sector. All core partners are from academia as they possess essential knowledge in education and their professional force is for qualification. However, in the Chemlab consortium, the participating enterprises take also main responsibility by hiring young graduates and providing them the opportunity to learn on-the-job.
At first, it was important to understand the local situation of VET in all participating countries and, thereby, to refer generally to education as well.

It is imperative to harmonize education by taking differences in culture and educational systems into account. Schooling in Germany without pursuing gymnasium (A-level path) finishes after nine or ten years, and graduates afterwards can embark for up to 3½ years in dual VET for becoming CLT ("Chemielaborant m/w"). In Greece the situation behaves comparably for the first nine years (disregarding A-level path). Until 2008, it was possible to pursue VET for CLT in a technical vocational school. The training however was to a large extent theoretically based and finished with a practical industrial course at the end. Currently, measures for CLT training are in progress. The basic structure, however, for dual training could be ascertained.

In Poland, basic school education plus gymnasium takes nine years. It is possible to follow a secondary line of education, which comprises three years in high school, three years in a profile high school, and another four years in a technical secondary school. In parallel to the latter, there is the possibility to learn for up to three years in a technician high school. Currently, a non-academic vocational training for becoming CLT is not existent. A typical educational path for pursuing training in a chemistry subject is normally via the university.

The basic education in Turkey lasts for eight years without A-level path and for twelve years with. After A-level, graduates have the possibility to study a chemistry subject at the university and to visit a vocational school at the same time. There is also a possibility of pursuing non-academic VET, but not for CLT at the moment. In Turkey, the basis for dual VET is provided.
Basic education in Georgia takes place for ten years in total. So far there is only the possibility to study a chemistry subject at the university. The academic education applies laboratory and industry internships, but the study-course has clearly a focus on theory. A non-academic vocational training for CLT is not existent and, hence, Georgia strives to facilitate VET in this respect. Both Turkey and Georgia are not having a European membership status but can be considered as pre-accession countries.

Conclusively, it can be said for the visited countries that vocational training in becoming a chemical worker currently runs via the academic line and/or in minor terms via technical schools. Practical courses and internships in companies are foreseen, however, an actual training-on-the-job such as in the sense of dual VET is not the case. Therefore, the next step in the Chemlab program is to establish a non-academic VET according to the dual system with national and regional specificities, since this level of education would suffice the demands from industry for skilled workers.

It is clear that training projects for youth on European scale are bound to subjects of mobility and quality of training. As such, mobility should be increased to exchange ideas while receiving training abroad. In addition, training should allow for transparency and orientation of a young person's capacity in performing work, as well as in having knowledge on the subject. In these terms, there are currently efforts going on to test out systems such as the European Credit system for Vocational Education and Training (ECVET) [1], which aims at validation and recognition of working skills as well as of knowledge acquired abroad, or the European Qualifications Framework (EQF) [2], which shall allow for facilitating a comparability of vocational qualification and competences among European countries.

The efforts in following up the road show shall hence mount into planning of further steps that take up these premises. While on one hand, standardized and ECVET incorporating dual training curricula can be developed in all partner countries, a certification system can further be established alongside, allowing for validation of learning outcomes that is not only acknowledged nationally but also transnationally, both by public educational authorities and the private chemical industry sector.

Such a dual vocational training can last for several years (typically 2½) and incorporate all relevant stakeholders from the public and private sector in all participating countries. Of course, the greater aim in the future would be the recognition for an EU certified CLT, once further partner countries become
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