

RCE Hamburg: Network KOMZET Building and Energy – Safeguarding the future through sustainability in vocational education

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RCE Hamburg

RCE Hamburg was acknowledged by the UN University on March 28, 2008.

Geographically, the RCE operates in Hamburg and its surrounding area which includes the city of Lüneburg. Hamburg, the second largest city in Germany, is a city of 1.8 million inhabitants. It is a prominent economic and cultural metropolis of northern Germany and has a high standard of living. The region has both urban and rural areas, and lies close to the North Sea and the Baltic Sea. The main goal of the RCE is to stimulate people to create a sustainable society including both education professionals and interested individuals. In particular, the RCE aims to make people aware about the responsible use of resources (for instance in construction, tourism or at home), alert individuals on how their behaviour contributes to climate change, embed sustainability issues in the curriculum, teaching the meaning of sustainable development, and stimulating behaviours that can become the norm outside of classrooms.

RCE Hamburg focuses on networking and cooperation within the RCE but also with other Education for Sustainable Development (ESD) fostering institutions. The RCE is officially represented by the Hamburg University of Applied Sciences, which acts as the Chair, and Ausbildungszentrum-Bau, the vocational training centre for the main trades of the construction industry, which assists in coordination (see UNU-IAS, 2009). The RCE views the development and delivery of training, interaction with established education structures,

as well as the promotion of ESD as the key to a sustainable future. The RCE also offers new learning materials, whose content focuses on issues such as renewable energy and the impact of climate change for use outside the classroom. These materials aim at helping students make changes in their daily lives. Teachers, lecturers, trainers and others involved in passing on learning are trained according to their new responsibility in teaching ESD (for example, see Hamburg University of Applied Sciences, 2012). The RCE showcases through pilot project approaches for applied ESD how to re-orient curricula towards sustainable development in the construction sector (Netzwerk KOMZET, 2012). The RCE also teaches students about the benefits of energy saving buildings, and provides them with the practical skills to implement these building strategies (Build with CaRe partnership, 2012).

The RCE also highlights behaviours that need to be adopted to make sustainable development possible (see Kuntikum, 2012). The Hamburg Institute of Applied Sciences, which is the lead organisation of the RCE, has created the International Climate Change Information Programme (ICCIP) to disseminate the latest findings from scientific research on climate change, to undertake education, communication and awareness-raising projects, and enable the networking of experts (Netzwerk KOMZET, 2012).

Project Overview and Achievements

Sustainability is becoming increasingly important for the construction industry. In Germany about 40% of CO2-emissions are caused by the construction sector. Due to cold winter temperatures, approximately 75% of the total energy consumption in a building in our region is used for heating. The German federal government, along with the member states of the European Union (EU), have set targets for greater energy efficiency and higher CO2 savings. As a result, Germany has pledged to reduce its emissions by 40% in comparison to 1990 measurements by 2020.



One strategic area for reducing energy consumption is in housing construction. In the Hamburg Metropolitan region, the "Passive House" standard is used by the construction industry as a key energy saving model. However on every one of these building-sites, there are many actors who are constructing a passive house for the first time and are not yet knowledgeable about it. There is, therefore, a high cost for quality-management that must be paid by the end-user. This suggests, on the one hand, a high need for training in future technologies, and, on the other hand, for greater quality requirements and communication.

There is also a growing focus on the energy efficiency of existing buildings. Here lurks the potential for many types of error. Errors that are made out of ignorance or indifference may not easily be overcome. As a result, targeted energy efficiency goals would not be achieved, so that the potential to be optimized over time is delayed. Consequently, there is also a great need for awareness of technically correct and conscientious building practices, as well as

knowledge of potential errors, and the subsequent consequences of these for the overall energy balance of the building. For both the areas of new-builds and refurbishments, a good sense of personal responsibility is required, as every individual has the opportunity to do something positive with regards to sustainability in his or her professional activity.

As a result, a key to these sustainable development issues in housing lies in vocational training. This has been recognised by the the nationwide KOMZET network, a network of competency centres for professional training in building and energy. Nine of these centres have joined together as part of the three-year *BauNachhaltig* ("BuildSustainable") project. Within this project, new learning materials are being developed with the intention of improving quality within the construction industry as high quality is a prerequisite for sustainability. These learning modules are currently in the developmental stage with the first pilot tests having taken place.

Project Context and Background

Prior to the development phase of the *BauNachhaltig* ('BuildSustainable') project, a survey analysis of small and medium-sized enterprises (SMEs) was conducted within the partner regions to explore relevant learning content. Technical support and centralised examination of the new learning materials and curricula was provided by Prof. Dr.-Ing. habil. H.-J. Holle, Director of the *Institute for Applied Building Technology* at the Hamburg University of Technology. Along with consideration of its own research, and in terms of the needs of education for sustainable development (ESD), concrete ESD-subject matter was formulated.

The following learning materials have been included for an integrative ESD approach:

• Developing trade interfaces for problem solving, new technologies, and methods in relation to sustainable development, in order to achieve a national standard in the vocational training within the construction industry;

• Identifying problems in on-site decision making;

• Developing appropriate quality and systems-thinking from the viewpoint of the craftsman and entrepreneur;

• Assuming responsibility (both operational and executive employees as a link in the chain/components in the system) from the viewpoint of the craftsman or entrepreneur; and

• Raising awareness in career guidance and emphasising the importance of the building and housing sector to sustainability

The newly developed ESD learning modules will be applied to training, adult education and vocational orientation. Within the apprenticeship process we want to incorporate the new learning materials into existing curricula. Through repeated reference to sustainability in their three years of training, illustrated through various practical examples, a model of sustainability is embedded, so to speak. It is essential that students can find their own individual place in the process and realise their own potential for action. In the area of further or continuing education, we offer the ESD learning modules to supplement existing courses. However, not only do we advocate lifelong learning as the key to professional success and competitiveness within the course of this project, we also try to promote its importance within the construction industry to students and school-leavers as part of career guidance.

Small and medium-sized enterprises (SMEs) in the construction sector are integrated throughout the process through regular exchange of information and workshops. Currently the development stages of the learning modules are underway and the first pilot tests have taken place. At regular meetings, the partners exchange information and experiences. The project has been supported in achieving its objectives through study and scientific monitoring by the University of Hamburg *Institute for Professional-and-Business Education* (IBW). The progress of the project is documented in a promotional newsletter. Finally a transfer of results including ESD approaches will be shared with other industries.

The three-year *BauNachhaltig* project is supported by the Federal Institute for Vocational Training (Bundesinstitut für Berufsbildung (BIBB)) with funding from the Federal Ministry for Education and Research (Bundesministeriums für Bildung und Forschung (BMBF)), as a contribution to the second half of the UN *Decade of Education for Sustainable Development*(2005-2014). A central goal of the UN-Decade is to anchor the concept of sustainable development in national education systems. But where does ESD fit into the *BauNachhaltig* project? ESD in the occupational field of construction in particular must emphasise the joint responsibility of every party involved in a building project to advance sustainable development outcomes. Without this joint responsibility, the overall project would be jeopardized Therefore the learning modules in this project take into account, not only technological topics, but also emphasise the important and necessary interaction of all the individual trades and managers at various points of interface, for example, between the contractor, the architect, and/or the site manager.

The joint participation of the affected trades groups in the learning modules is recommended. In educational practice, we have good success with such interdisciplinary learning. This learning success is even greater if one demonstrates how real players must interact in a real-life building process. Therefore, construction is better considered and discussed as a system, since the individual components and elements are often created by different hands. Thus, a higher level of assembly, quality awareness, and communication with one another needs to be practiced. The craftsperson's own performance is judged through the overall quality of the building and, if necessary, improved upon. The comprehensive action-based learning methods of German vocational training is integrated in this educational process. Action-orientated learning promotes the independence of the trainee and encourages active and reflective learning enabled through transferable knowledge and behaviour patterns. This ability to operate in new situations every day is an essential component of ESD. The learning phase of this self-contained action module consists of project learning assignments on Information, Planning, Decision making, Executing, Controlling, and Evaluating.

More knowledge and understanding is required than simply that of construction technology. This is especially the case in modern building designs such as the high energy-saving Passive House, which has no active heating system to warm its rooms (as it has a controlled mechanical ventilation system with excellent heat recovery). The user is viewed as an essential component of the housing system and must learn to behave accordingly—in a similar way to how he or she must adapt to a new mobile phone. The trainees learn to recognize relationships that affect not only their professional field, but also their private lives. The new learning modules address the needs of companies in the construction sector and their employees. We empower them to act in their professional environment and sphere of influence in terms of sustainability. They learn to take responsibility, which they can also

transfer to their private lives, as they understand connections between these spheres. New behavior patterns can be transferred and exchanged among their circle of friends or in their peer-groups. For example, energy-saving, resource conservation or the recycling of used materials does not finish at the end of the working day, but can be continued with conscious and controlled power consumption at home.

The learning materials produced in this project fit very well with the many requirements included in the overall vocational training plans of individual professions. It is thus possible to exploit existing frameworks. However, there lacks sufficient time in the training period to deal with all of the learning content to address sustainability issues in-depth. For education for sustainable development to be implemented politically, another solution must be found, so that more focus can be placed on sustainability issues. It is, in general, difficult to maintain consistency in basic knowledge while responding to growing demands for new technological developments in the building sector. The vocational training should always retain a strong practical emphasis. Therefore in the *BauNachhaltig* project, we try to accommodate as much education for sustainable development as possible in the active learning and practical exercises. this is especially the case in project-type learning assignments where important connections are recognised. Responsibility, awareness of quality, and effective communication are practiced with other players.

With the BiBB as the responsible institution for the further development of vocational training and, in this case, coordinating the ESD funding programme, we are developing exemplary results through a series of pilot projects. Together with the results from the scientific monitoring taking place, we will formulate recommendations in the period following the project. It is not sufficient to only use the results at the project level or only among the project partners. In the future, we must share this knowledge and these concepts widely. In our industry this means, above all, that we must instruct teachers in ESD. Further training for teachers or instructors on ESD teaching methods is of vital importance and must become an essential part of the post-project strategy in order to secure long-term success. SMEs must continue to be involved in the project through a steady flow of information, participation in interviews and workshops, and through trials of the new learning modules. At a workshop of the scientific monitoring team to be held in June of 2012 (at which all the projects of the ESD funding programme are to be represented along with the responsible parties from the BiBB and the BMBF) transfer options will be presented and discussed.

Concluding Reflections

If as a society we want to achieve the ambitious climate-protection goals and implement the needed energy policies, we will only be successful through developing appropriate information and and educational measures. Every citizen has a shared responsibility to ensure its success because every person can--and must--help shape the process of sustainable development. Climate protection and the reduction of CO2 emissions through energy conservation are generously funded by the German government and often supplemented through local programmes. Many of these programmes offer funding opportunities for private persons and investors. It is not enough, however, to only provide good learning opportunities within the sphere of adult education. We must also engage businesses within the building sector to convince them of the necessity of further training. Unfortunately, there is often a shortage of qualified craftsmen--from the planning to the execution level—to exploit the potential of sustainability. For example, some training courses

are only offered for the planners of a passive house, but the contracted craftsmen are not further trained. So how should sustainability in practice look? Even more local initiatives must be created where participation is designed to be easy and flexible for building practitioners. The *BauNachhaltig* project team is working on just this. The current project provides an important opportunity to promote sustainability in the construction industry and reminds businesses of their responsibility as entrepreneurs to advance the concept of Corporate Social Responsibility.

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