

Vocational education and training for sustainable development: backgrounds, activities, initial results

► Education for sustainable development has received something of a boost, this being evidenced by the UN Report on Climate Development, by the declared will of politicians and political parties to strengthen climate protection and drive sustainability forwards and by the UN Decade of “Education for Sustainable Development” and its attendant national follow-up activities. The present paper explains the educational dimension of the central idea of “sustainable development” and describes the processes and findings which have emerged from the “Vocational Education and Training for Sustainable Development” programme (known by its German abbreviation of BBNE).

From the central idea of sustainable development to the World Decade of Education for Sustainable Development

The concept of sustainable development was developed against the background of increasing findings relating to observed or forecast changes to the environment caused by humans. In 1987, the World Commission on Environment and Development defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs and to choose their own lifestyle”. The concept accords equal status to the aims of social justice, ecological sustainability and economic performance (“sustainable development triangle”).

In December 2002, the General Assembly of the United Nations resolved that the period between 2005 and 2014 would be the UN World Decade of “Education for Sustainable Development”, the objective being to use educational measures as a vehicle for contributing to the implementation of Agenda 21 Chapter 36¹, agreed in Rio de Janeiro and reinforced in Johannesburg, and firmly establishing the principles of sustainable development on a worldwide basis within national education systems. UNESCO was assigned the coordination of this World Decade.

The German UNESCO Commission developed a national action plan founded on a series of principles relating to Education for Sustainable Development. These principles served as the basis for the formulation of four overarching goals.

1. Further development, bundling of activities and broadly based transfer of good practice.
2. Networking of educational stakeholders for sustainable development.
3. Improving public perception of Education for Sustainable Development.
4. Strengthening of international cooperation.

¹ Agenda 21, Conference of the United Nations for Environment and Development, staged in Rio de Janeiro in June 1992.



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Principles of Education for Sustainable Development (ESD)

- ESD is relevant for everyone
- ESD is an ongoing, continuous process and promotes acceptance of processes of societal change
- ESD is a cross-sectoral task that has an integrative function
- ESD is aimed at improving the contexts in which people live
- ESD creates new opportunities for individuals, society and economic life
- ESD promotes global responsibility

Source: National Plan of Action for Germany. UN Decade „Education for Sustainable Development“, Berlin 2005 (www.dekade.org).

These aims are also in accordance with the “Revised EU Strategy for Sustainable Development”, which was passed in June 2006 and which accords particular significance to education. European commitment towards the implementation of these objectives in the interest of Education for Sustainable Development was also reinforced via the Berlin Conference on the UN Decade staged in May 2007 within the scope of the German EU Council Presidency.

Former Secretary General of the United Nations Kofi Annan summed up the problems associated with implementing “Education for Sustainable Development” and the aims of the UN Decade in the following terms. “Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a daily reality for all the world’s people.” In order to make an idea which may appear abstract reality for all, the idea needs to be acted upon and made a part of everyday life. This is also a primary task for the educational sector. For this reason, the Federal Government coalition agreement has accorded sustainable development a high degree of significance for government action at a domestic, European and international level. Federal Minister of Education and Research Annette Schavan emphasises that ESD connects past and future, conserves the old and shapes the new. This process means much more than passing down facts and techniques. Education for sustainable development involves the formation of values and attitudes whilst combining subject knowledge and “orientation” knowledge by networking scientific/technical, socio-cultural and philosophical/ethical teaching contents. In this manner, ESD “promotes economic, cultural, social and political participation in a world that is speeding up and becoming ever more complex”.²

“Vocational Education and Training for Sustainable Development” action programme

The implementation of the sustainable development mission statement also represents a major challenge for vocational education and training stakeholders. In scarcely any

other field of education does the acquisition of competences for sustainable employability skills exert such a major effect on the future viability of economic, technical, social and ecological developments than is the case in companies involved in trade and industry. For this reason, the task of vocational education and training is to provide people at all levels from skilled worker to management with the ability to assume responsibility and conduct economic activity in a resource-efficient and sustainable manner whilst also shaping globalisation in a just and socially acceptable way. Both the inherent insecurities and contradictions involved and the increasing attendant complexity and networking require an expert approach to be adopted.

Once a feasibility study had been completed³, the Federal Institute for Vocational Education and Training (BIBB) was commissioned by the Federal Ministry of Education and Research (BMBF) to spend the period between 2000 and 2003 in preparing a “Vocational Education and Training for Sustainable Development” action programme (known by its German abbreviation of BBNE). Around 20 so-called stakeholder conferences were staged during this preparatory period, which focussed on sounding out how thematic or sectoral occupational activity related to sustainable development and on drawing up the structural correlations between sectors of trade and industry and a raft of issues related to the topic.

From 2004 onwards, BIBB acted within the scope of its statutory duty to “promote pilot projects including the provision of academic research support” by making the implementation of the sustainable development mission statement within vocational education and training a central focus of its work. Within this context, economic pilot projects funded by the BMBF are being conducted in the areas of: sustainable development as an economic factor and management strategy in industry and the craft trades; energy efficiency and efficient use of resources and sustainability in vocational education and training. In addition to this, BIBB has since 2005 been conducting analyses of the effects of specialist and sociological research in respect of further developments of occupations within the forestry and woodworking sector in pursuit of the objective of determining training requirements and preparing such qualification needs for vocational education and training practice.

The Project for Sustainable Forestry (Sustainability Research, referred to by its German abbreviation of FONA) comprises 23 cooperative projects. The central focus is on

² Based on a quotation from SCHAVAN, A.: Die UN-Dekade “Bildung für nachhaltige Entwicklung” aus der Sicht der Bundesregierung. In: unesco heute, Issue 1/2006, p.9

³ Cf. MERTINEIT, K.-D., NIKOLAUS, R., SCHNURPEL, U.: Berufsbildung für eine nachhaltige Entwicklung – Machbarkeitsstudie im Auftrag des BMBF, Bonn 2001

how regional, national and global forestry and woodworking added value chains – including forestry where the emphasis is on operating in harmony with nature, the innovative use of wood and technological development – can be optimised in a profits oriented, ecologically acceptable and socially just manner and how further developments can take place.

Activities and implementation strategies for establishing BBNE on a firm footing

The BBNE concept is being implemented within BIBB via a dialogue-based participative process which integrates as many stakeholders as possible. The stakeholder conferences enabled a network to be created, culminating in the staging of a first national conference in 2003.⁴ This conference acted in accordance with the principles and objectives of the National Plan of Action for Germany formulated by the German UNESCO Commission in deciding upon a Guidance Framework for BBNE which set out the essential structures for further implementation in the form of six action areas.

Action areas for the implementation of BBNE

1. Identification of general occupational core competences for sustainable development and piloting of relevant didactic concepts.
2. Identification of occupationally specific skills within the new mission statement and the implementation of these within teaching and learning arrangements.
3. Identification of relevant sustainable fields of activity to act as a basis for the determination of additional qualifications and/or new training content for initial and advanced training occupations including the development of new advanced training regulations where necessary.
4. International cooperation on sustainable development encompassing global and intercultural learning.
5. Creation of permanent and dynamic sustainability structures within initial and continuing vocational education and training.
6. Establishment of a communication and dissemination structure of networks and cooperative ventures to further raise awareness of sustainable development and for the purpose of actively disseminating findings and examples of good practice.⁵

The implementation of the mission statement involved the rolling out of a series of various activities and the pursuit of a range of implementation strategies (cf. Figure 1).

Development of the Good Practice Agency (GPA)

The BIBB Sustainability Portal has been documenting “examples of good practice” in the form of a Good Practice Agency since 2003. The difference between successful examples and theoretical reasonings and considerations is that the former provide encouragement and stimulate similar projects. The Good Practice Agency is used by a wide range of working groups as a network (NiBA) and now contains documentation of over 100 examples from practice complete with suggestions for implementation. These include 50 examples relating to vocational training which have won awards during the UN Decade. The “examples of good practice” listed encompass such areas as factory and work projects, teaching projects, simulated companies for young people and competitions.⁶ These act as a vehicle for rendering BBNE visible at the various learning venues (vocational training centres, companies, vocational schools).⁷ These learning arrangements have proved to constitute particularly effective learning activities for introducing trainees/pupils at vocational schools to a sustainable approach.

Examples of projects which can be mentioned here include “Rasselstein saves resources”. In the “Pack the future” competition, a team of trainees carried out research in their own training proving company (a thin sheet metal manufacturer) into opportunities for saving process heat and compressed air and also looked into the more effective use and clarification of coolant water. The team made a significant contribution to reducing operating costs as well as winning first prize. Such a positive example may well generate further sustainability activities and may also act as a stimulus for other trainees/pupils at vocational schools to instigate their own projects.

The “examples of good practice” listed in the GPA provide for main starting points for BBNE.

1. Indications of (publicly effective) didactic and methodological models for competence acquisition within BBNE.
2. Examples and strategies for the structuring of vocational training centres with regard to sustainable development.
3. Communicative networking of stakeholders to establish BBNE in a broadly based and qualitative manner.

⁶ Cf. in this regard German language documentation relating to the competition “Pack the future”, available on the BIBB Portal “Berufsbildung für eine nachhaltige Entwicklung”. – www.bibb.de/de/nh_16467.htm

⁷ Cf. in this regard “Good Practice” German language documentation in the BIBB Portal “Berufsbildung für eine nachhaltige Entwicklung”. – www.bibb.de/de/nh_8966.htm

⁴ Cf. BMBF (Ed.): *Erste bundesweite Fachtagung “Berufsbildung für nachhaltige Entwicklung”, 26 and 27 March 2003 in Osnabrück, Bonn 2003*

⁵ BMBF (Ed.): *pp. 174*

Activities and implementation strategies for establishing BBNE on a firm footing

► Internet-Portal

www.bibb.de/nachhaltigkeit
continually updated since 2003
linked to the UN Decade Portal since June 2007

► Specialist conferences /specialist congresses

Specialist conference "Sustainability in Vocational Education and Training" 2006
University Conference on Vocational Education and Training 2004 and 2006
Didacta: Forums "Transparent Specialist Conference" (2006) and "Sustainable Forestry" (2007)
BIBB Congress: Forum „Sustainable Development in Vocational Education and Training" (2007)

► Pilot projects

Main focus Vocational Education and Training for Sustainable Development
Term: 2001–2010

A total of 11 pilot projects, including:

- Development of an indicator model for the measurement of sustainable development
- Development of a course "Renewable raw materials – biogas"

► Research programme

"Sustainable forestry"
Term: 2005–2009
Focussing on such aspects as the establishment of a pilot region "Berlin Forest"⁸
Vocational Education and Training for Sustainable Development 2003–2005

► Working groups /committees

UN Decade 2005–2014:
National Committee⁹
Round-table discussion forum for all educational sectors
Federal Working Group on Initial and Continuing Vocational Education and Training (chaired by BIBB)

4. Development of central questions relating to the acquisition of quality criteria and standards for good practice for Vocational Education and Training for Sustainable Development through comparative observation of the examples.

Analysis of "examples of good practice" takes place via central questions which serve the purpose of operating within the context of BBNE to identify, describe and explain innovative approaches and ultimately evaluate these in terms of their transferability and effectiveness. The eventual aim is the further conceptualisation of the idea of sustainability within vocational education and training and the transfer of good practice.

In individual terms, evaluation of the practical examples needs particularly to take place with regard to the following issues.

⁸ The Berlin Forest pilot region implements regionally sustainable projects related to the theme of forestry and wood. One example was a cross-occupational and cross-sectoral project involving trainees from the branches of forestry, joinery, the book trade and the media who worked jointly on the establishment of a forestry and wood value-added chain extending the whole length of the production process from the tree to the book. Results oriented exchange takes place between the pilot region and selected cooperative projects.

⁹ Cf. www.dekade.org and www.bne.de

- *Understanding of sustainability:* Which correlations with the dimensions of sustainable development are explicitly or implicitly discernable in the example? Is due consideration accorded to the three dimensions of sustainability (ecological, economic and social aspects)?
- *Learning understanding/didactic concept:* To which extent are development and self-direction of the initiative on the part of the trainees/learners or by the teacher or trainer clearly represented in proportional terms?
- *Marketing and transfer:* How open are the projects to dialogue once they have been included in the Good Practice Agency? What side-effects does the project exert within its own educational establishment? Are projects given feedback once analysis has taken place? How are the results and products achieved transferred? Do Decade Projects win further awards after a period of, for example, 2 years when they are presented in a redeveloped or further developed form?
- *Correlation with occupation and training:* Which thematic categories are capable of being mapped in terms of the aim of occupational implementation and which vocational training levels are affected?

Implementation of Vocational Education and Training for Sustainable Development (BBNE)

The central questions are currently serving as a vehicle for the development of quality standards for all levels of BBNE on the basis of the examples from practice. Although the analysis of the GPA and of the further activities has not yet been completed, it is already apparent that the implementation of BBNE needs to address all three levels of the vocational education and training system (macro, meso and micro levels) in order ultimately to be able to fulfil the objectives of a modernisation strategy (cf. Figure 2). At the micro level of vocational training, the aim is to develop practice related VET work and learning situations which are capable of implementation in everyday working life and which will operate in accordance with quality standards still to be defined (such as correlation with the lifeworld of the learners and relevance of learning content in terms of education and utilisation).

Evaluation questions in respect of the quality standard and sustainability at the meso level, the level at which companies, educational providers, vocational schools and other educational establishments operate, need to provide information on how it will be possible to act in the interest of sustainability by facilitating high-quality learning outcomes at an institutional level. The quality criteria act as a vehicle for such aspects as determining the suitability of learning venues for certain content, the further development of learning venues to form sustainable vocational

training centres or for cooperation between learning venues in learning regions committed to the axiom of sustainability.

A third quality criteria level encompasses such areas as the potential of initiatives, proposals and pilot projects to bring about change in current vocational education and training to move in the direction of Vocational Education and Training for Sustainable Development. This means that we need to address the issue of whether implications may be drawn from the individual activities for the further development of the vocational education and training system (macro level) and the extent to which such implications may be drawn. These implications may relate to such aspects as regulatory work or permeability between the educational sectors.

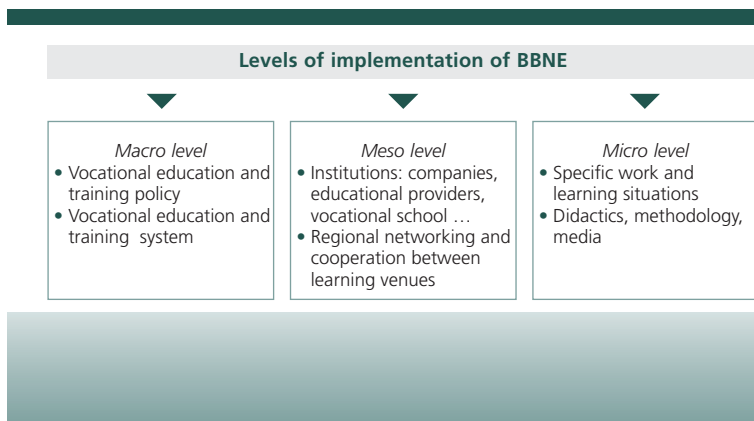
How things stand as of 2007: Vocational Education and Training for Sustainable Development (BBNE) as a modernisation strategy for vocational education and training

An obvious step would be to use the BBNE Programme as a comprehensive modernisation strategy in vocational education and training and to undertake relevant differentiation. The main focus here is on four main aspects.

Although there is evidence of positive approaches towards implementing BBNE in companies, a rise in the number of Bachelor and Masters courses of study relating to sustainability and an increase in the amount of advanced vocational training provision (especially in the areas of renewable energies, energy consultancy and sustainable building services engineering), vocational education and training stakeholders still find themselves engaged in a discussion, development and piloting process. This has been revealed via such measures as the training place initiative instigated by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The span of implementation opportunities which has been expressed ranges from the view that training regulations and their relevant skeleton curricula need to contain sufficient training content to permit activity within a sustainable area to demands for the creation of an independent training occupation, preferably in the renewable energies sector.

A further positive aspect is the fact that the craft trades have committed themselves to sustainable development and to the objectives contained within Agenda 21. The construction industry and its associated craft trades are leading the way in terms of commitment to saving energy, increasing energy efficiency and climate protection. The link between environmental policy and employment policy is important

Figure 2 Implementation of BBNE



given the emergence of new environmental markets within the craft trades sector such as via low energy construction methods, recycling (scrap cars and electrical waste) and the use of environmentally friendly sources of energy (photo voltaic, wind energy, biomass, geothermal energy). This implies new skills needs for employees and will require the implementation of new learning concepts together with new strategies for initial and continuing training for training staff.

Vocational Education and Training for Sustainable Development (BBNE) requires:

- new forms of sensitisation to sustainable development in all areas where insights as to the necessity of sustainable development are not yet sufficiently advanced, enabling this to serve as a basis for further development. Such interventions to raise awareness may comprise “workshops of the future”, presentations using the special “sustainability case” or a company check involving a self-assessment instrument;
- innovative didactic and methodological concepts for the implementation of BBNE in teaching and learning arrangements via such vehicles as simulated companies for young people;
- learning venues which implement sustainable development in a credible manner. These may take such forms as the demonstration of sustainable use of energy. In addition to this, sustainability indicators¹⁰ have been developed for educational establishments to make the sustainability of a vocational training centre measurable in terms of its management, organisation, educational provision and cooperation with other learning venues, thus enabling a comprehensive representation of the quality criterion for the vocational training centre;
- systematic integration into the vocational education and training system, whether this takes place in the form of additional qualifications for selected occupations or occupational groups or via the introduction of a standard occupational profile item into training regulations addressing sustainability in the same way as such an item already exists for environmental protection or in the same way that the concept of “responsible care” has already been introduced into laboratory occupations. Debate needs to continue on the implementation of sustainable training content into examination regulations and skeleton curricula. Suggestions are available in relevant brochures.¹¹

¹⁰ MERTINEIT, K.-D.; HILGERS, M.: Nachhaltigkeitsindikatoren für Bildungsstätten. Edited by BIBB, Bielefeld 2004

¹¹ BMBF (Ed.): Duale Berufsausbildung im Bereich erneuerbarer Energien, Bonn 2007

Notwithstanding this, there remains a perception on the part of those involved in practice that further action is required in terms of implementing sustainable business practices. A study conducted by the Chambers of Industry and Commerce of the States of Rhineland Palatinate and Saarland has, for example, revealed that 73 percent of companies involved in production would like to receive assistance in increasing energy efficiency due to the fact that insufficient knowledge means that insufficient use is being made of the potential to save energy.

General schools and their organisations have already moved one step further than many companies. Both the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK) and the German UNESCO Commission (DUK) have expressly committed themselves to the curricular implementation of sustainability in education. "Education for Sustainable Development (ESD) may change teaching and schools in such a way so as to make our world more sustainable. We will redouble our efforts in all areas of school education in order to achieve the objectives of the World Decade. Both the KMK and the DUK support schools in implementing Education for Sustainable Development." The joint declaration¹² issued by the two bodies provides specific assistance for the implementation of ESD in schools and lays out the general conditions under which funding can take place.

In addition to this, a guidance framework for the learning area of "global development" drawn up by a KMK-BMZ (Federal Ministry for Economic Cooperation and Development) working group demonstrates how competences in this important ESD learning area are being firmly anchored in curricular terms, across a range of subjects and in cross-disciplinary and inter-disciplinary forms of teaching or learning fields. The implementation of ESD within teaching and school development also requires the fostering of relevant competences in all phases of teacher training. During their initial training, teachers should be able to acquire competences enabling them to impart the topic of sustainable development in a professional manner both in terms of content and methodology.

A principle focus of vocational education and training research both within the scope of occupational skills research and within the context of the research undertaken by educational specialists in their own respective occupational fields and occupations is developing sustainable actions and business practices within companies as an

essential aspect of sustainable development and laying down the didactic ground for initial and continuing training.

In the case of complex processes and products, computer aided simulations and simulated management games may provide effect support in identifying areas where there is scope for action. The focus here extends beyond company and branch specific analyses to encompass analyses of activities, products and services. This is another area where a link can be established to the successful work conducted in the stakeholder conferences. Pilot studies and projects assist in identifying scope for action. A synopsis of initial and advanced training regulations with references to sustainability and of the relevant school-based skeleton curricula according particular attention to items within the occupational profile exhibiting correlations with sustainability could support the investigation into work conducted during vocational training.

Forecast

The concept of Vocational Education and Training for Sustainable Development does not yet currently enjoy the level of significance with vocational education and training practice, research and policy which would permit it to lay a justified claim to constituting a comprehensive modernising strategy. Firstly, a number of potentially uncovered areas and research desiderata remain to be identified within BBNE. These include such aspects as cooperation between learning venues, sensitisation and training for educational staff. Secondly, it has thus far only proved possible to meet the structural requirements of vocational education and training practice in part. A new and comprehensive "BBNE Development programme" may serve as a vehicle for a firmer implementation of the philosophy of sustainability within vocational training and enable it to be established on a broader basis. BBNE could become a future joint future project to be undertaken by (vocational education and training) practice, policy and academic research if it builds on the previous experiences of BIBB, the continuous inflow of new findings emerging from research projects and a further generation of pilot projects focussing on BBNE, the development of comprehensive media and methods, the bundling and organisation of action programmes and PR measures. ■

¹² Recommendation of the KMK and the German UNESCO COMMISSION on ESD in Schools, 27 June 2007