“SOSTENIBILIDAD Y TRANSICIÓN VERDE EN LA EDUCACIÓN Y FORMACIÓN PROFESIONAL DUAL.”

31 de agosto de 2023
Plataforma Zoom
Decarbonization
Digitization
(Demography)
TVET and sustainable supply chains

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Instituto Federal de Formación Profesional
(BIBB)
I. Understanding and dimensions of sustainability
   a. Thinking sustainability and vocational training together
   b. General education - environmental education and permeability of the vocational training system

II. Ways to sustainable education and training
   a. School as a place of learning - environmental education and permeability of the vocational training system
   b. Learning site company - supply chains and sustainability management

III. Climate-relevant job profiles

IV. Structural mechanisms and governance
   a. Standard job description positions
   b. Research approaches – foresight

Summary
I. Understanding and dimensions of sustainability
   a. Thinking sustainability and vocational training together

   Economic dimension
   - Precautionary management; circular economy
   - Substance-stream management; environmental management system
   - Environmentally compatible, innovative technologies
   - Eco-design (service life, disposal friendliness, aesthetics)
   - Ecological and social truth of prices
   - Polluter pays principle
   - Regional and local marketing networks and fair trade

   Job-specific profiling
   Operational-organizational
   Socially entrepreneurial

   Digitization
   Decarbonization

   Sustainable development
   - Demographic changes
     - Subjectively meaningful (me)
     - Socially responsible (us)
     - Factually sustainable (it)

   Ecological dimension
   - Economical use of resources
   - Time measures of nature (regenerative capacity, proper time)
   - Biodiversity
   - Ecological cycle systems
   - Regenerative energy
   - Precautionary principle
   - Avoidance of stress on the ecosystem
     (Reduction of pollutant inputs, emissions, waste)

   Cultural dimension
   - Ethical reassurance
   - Sustainability-oriented lifestyles
   - Holistic perception of nature; aesthetic perception of sustainable development
   - Traditional knowledge; dealing with time
   - Culture of dealing with things
   - Consumer awareness; local public; international exchange
   - Global responsibility; cosmopolitan culture

According to Stoltenberg 2010 and M. Bretschneider, 2022
I. Understanding and dimensions of sustainability

b. General education - environmental education and permeability of the vocational training system

<table>
<thead>
<tr>
<th>Universities, TU, technical colleges, Distance learning universities, Dual study Dual training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientists, Engineers etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High Schools</th>
<th>Vocational High School</th>
<th>Integrated secondary school</th>
<th>G-School</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Schools From grade 5 or 7</td>
<td>Integrated secondary education from class 7</td>
<td>Community school</td>
<td></td>
</tr>
<tr>
<td>Scientific and technical principles, environmental protection in economy and society, sustainable development</td>
<td>Ecological Interrelationships, environmental impacts, consumer behavior</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elementary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>First environmental education, environmental media, people, animals, plants</td>
</tr>
<tr>
<td>KITA - Playing and learning in nature („pre-school“/kindergarten)</td>
</tr>
</tbody>
</table>

- Continuing education for sustainable development
- Adult Education Centers
- Citizen:inside education - Citizen Science
- Vocational Orientation
  - Quality of continuing education
  - Advancement qualification
  - Supra-company training
  - Training personnel
- Vocational orientation/internships Teachers - quantitative and qualitative
Cross cutting competence – sustainability and environment

Occupational profile positions/knowledge and skills

- In work processes and with regard to products, goods or services, materials or services, materials and energy under materials and energy under economic, environmental and social aspects of sustainability

- Origin and production
  - Transport routes
  - Service life and long-term usability
  - Ecological and social footprint of products and services or of value creation processes.
  - Test seals and certificates, e.g.:
    - Fair trade
    - Regionality
    - Ecological production

- Possibilities for avoiding operational burdens for the environment and society in their own area of responsibility recognize and contribute to their further development

- Resource intensity and social significance of business and work processes or value chains.
- Analysis of consumption data
- Perception and avoidance or reduction of burdens, e.g.:
  - Noise
  - Exhaust air, wastewater, waste
  - Hazardous substances
- Rational use of energy and resources, e.g.:
  - Equipment running times
  - Maintenance
  - Service life of products
  - Handling of storage and print media
- Waste avoidance and separation.
  - Recycling, e.g.:
    - Recyclables
    - Recycling
    - Repair
    - Reuse
- Sensitivity to environmental pollution, also in adjacent work areas
II. Ways to sustainable education and training

a. School as a place of learning - environmental education and permeability of the vocational training system

Sustainability in the value chain
Cereals - Flour - Bakery products

Raw materials for the bakeries and Food industry

Grain cultivation
Varieties
Storage

Mill

Processing

Regional concepts - short transport routes
### II. Ways to sustainable education and training

#### a. School as a place of learning - environmental education and permeability of the vocational training system

<table>
<thead>
<tr>
<th>Action level</th>
<th>Field of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson/Learning group</td>
<td>Teacher competencies, materials, textbooks, student competencies, instructional development.</td>
</tr>
<tr>
<td>School</td>
<td>School profiles, school life, school curricula, school management including budgets, parent participation, school development</td>
</tr>
<tr>
<td>School Board, Inspection</td>
<td>Quality assurance, (system) consulting, budget management</td>
</tr>
<tr>
<td>Ministries, subordinate Authorities</td>
<td>Legal framework in the sector, budget, curricula/curricula, quality framework, exams.</td>
</tr>
<tr>
<td>Universities, study seminars, State Institutes</td>
<td>Education and training</td>
</tr>
<tr>
<td>Colleges, universities</td>
<td>Research and teaching in educational science and didactics</td>
</tr>
<tr>
<td>Out-of-school education providers: NGOs, denominational institutions</td>
<td>Educational projects, partnerships, experts, extracurricular venues</td>
</tr>
</tbody>
</table>

According to a project example HIBB, 2019
Sustainability - International
Brasil

Cooperativa Agrária
Pinhão - PR

Source: Christos G. Athanassiou
II. Ways to sustainable education and training

b. Learning site company - supply chains and sustainability management

What can management do

- Qualification of vocational training staff as promoters of sustainability in the learning venues of vocational training.

- Teaching by full-time and part-time training staff of relevant job-specific and cross-job sustainability skills and relevant sustainability aspects of company teaching/learning environments.

- Qualification of trainees as junior experts for sustainability in the company.

- Appreciation of the sustainability contributions of trainees and instructors and publicizing them within the company.

- Internal evaluation of the systematic integration of sustainability in the training process and monitoring of the development into a sustainable place of learning.

What can trainees actively do

- Record videos and podcasts
- Create flyers and brochures
- Create sustainability team
- Support Human Rights
- Mentoring of other trainees
- Organize events
- 5-minute calls
  - Current developments in sustainability (Economics, Politics and society
  - Discussion of own points of view (personal and professional)
  - Business games in which trainees take on the roles of decision-makers along real processes
III. Climate-relevant job profiles

**Climate Careers**
- Plant mechanic, Electrician, Electronics technician
- Heating engineer, gas and water fitter
- Plant mechanic for sanitary, heating and air conditioning technology (SHK)
- Electronics technician for energy and building technology
- Electronics technician for building systems integration
- Roofer with focus on energy technology on roof and wall
- Painter
- Industrial clerks

**Electromobility (20 professions)**
- Electrical and IT industry and skilled trades and in the automotive trade
- Railwayman:in in the operational service (locomotive driver and transport)
- Professional driver
- Railroad and road transport clerks, transport service clerks
- Railroad worker: train traffic control, track builder

**Merchants**
- Wholesale and foreign trade management assistants
- Retail salespersons

**Environmentally friendly packaging**
- Paper technologist
- Packaging technologist

**Green professions**
- Apprenticeships in the agricultural sector, the "Green 14", environmental and climate protection in handling with soils, plants and animals and modern technology
IV. Structural mechanisms and governance

a. Standard job description positions

BIBB HA Recommendation No. 172

Standard goes beyond the effective date in occupations from 01.08.2021:

"In addition, the BIBB Board recommends that training companies and vocational schools should already teach these modernized standard occupational profile items as an integral part of the training for all training occupations under the BBiG and HwO in conjunction with subject-specific skills, knowledge and abilities throughout the entire training program, even if they are not yet included in all training regulations.

It appeals to all players in vocational education and training to actively support this by drawing the attention of training companies and vocational schools to this recommendation of the main committee and the importance of the new standard vocational training positions for the world of work of the future in various ways, by promoting their implementation and by providing them with suitable support in doing so."

Source: https://www.bibb.de/dokumente/pdf/HA172.pdf
IV. Structural mechanisms and governance

b. Research approaches – foresight

Assess changing skills requirements and qualification gaps in skilled occupations along the hydrogen value chain.
## IV. Structural mechanisms and governance

### b. Research approaches – foresight

### Supply Chain in H2

<table>
<thead>
<tr>
<th>Wind/Offshore</th>
<th>Solar plus concentrated solar power</th>
<th>Bioenergy</th>
<th>Geothermal Energy</th>
<th>Other</th>
<th>Energy Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Storage</td>
<td>Thermal Storage</td>
<td>Cool Storage</td>
<td>Other</td>
<td>Energy Storage</td>
<td>Electrolysis</td>
</tr>
<tr>
<td>H2</td>
<td>Ammonia</td>
<td>Oxygen</td>
<td>Methane</td>
<td>Other</td>
<td>H2-Storage</td>
</tr>
<tr>
<td>Preparation</td>
<td>Pipelines</td>
<td>Shipping/Truck</td>
<td>Other</td>
<td>Other</td>
<td>Customers</td>
</tr>
</tbody>
</table>
IV. Structural mechanisms and governance
b. Research approaches – foresight

Assess changing **skills requirements** and **qualification gaps** in skilled occupations along the hydrogen value chain

**Short-term**
First qualification curriculum (72 hours) developed by provider and timely reaction to qualification needs of an evolving market; Basic knowledge of the subject

**Midterm-/Long-term**
Integration in higher vocational training (Master VET)
Qualification along the hole supply chain with alternative energy source

<table>
<thead>
<tr>
<th>Module 1 – economic/ecologic basic knowledge</th>
<th>Module 2 – properties of H2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 3 – Production of H2</td>
<td>Module 4 – H2 Technology</td>
</tr>
<tr>
<td>Module 5 – Storage and Transport</td>
<td>Module 6 – Environmental protection and labour security</td>
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<tr>
<td>Module 7 – legislation and regulation</td>
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</table>
Summary

Facing the challenges - decarbonization, digitalization and demography

I. The dimensions of sustainability are - ecological, economic, social and cultural
   • Objectively meaningful (me)
   • Socially responsible (we)
   • Factually sustainable (it)

II. General education - environmental education and permeability of the vocational training system
   • Penetration of the entire formal education sector contributes to sustained awareness

III. Pathways to sustainable education and training

School as a place of learning - bottom-up approach - teaching/learning group - School Supervision/inspection Ministries, subordinate authorities, universities, study seminars, state institutes, colleges, universities

Learning location company - intrinsic motivation of the management together with training
   • Qualification of vocational training personnel, teaching by full-time and part-time training personnel of relevant occupation-speciﬁc and cross-occupation sustainability competencies and relevant sustainability aspects of company teaching/learning environments
   • Qualification of trainees as junior experts for sustainability in the company
**Summary**

**Facing the challenges - decarbonization, digitalization and demography**

IV. **Climate-relevant job profiles**
- Analysis on the impact of active climate policy to be considered in all professional profiles

V. **Structural mechanisms and control**
- Standard occupational positions - agreement on a minimum framework.
- Research approaches - foresight on the megatrends of digitalization, decarbonization and demography
Thank you

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www.govet.international/en
www.govet.international/es
govet bibb - YouTube
kress@bibb.de
GRACIAS

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