

Green Skills

Transdisciplinary Education for Transformative Action

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12th Stakeholder Conference of Priority Area 9
of the EUSDR



Current Status



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- Human activities have caused global warming – surface temperatures reaching 1.1°C
- Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere (affecting weather and climate extremes)
- Climate related risks are constantly rising
- Limiting human-caused global warming requires net zero CO2 emissions

(IPCC, 2023)

Goals to be met



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The European Green Deal

- No net emissions of greenhouse gases by 2050
- Economic growth decoupled from resource use
- No person or place left behind

What is needed?



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- Transition to low-carbon, resource-efficient economy requires **systemic changes**
- Changes in **production processes** and **business models**
- **Change in skills** is required



“Knowledge, abilities, **values and attitudes** needed to live in, develop and support a sustainable and resource-efficient society.”

(CEDEFOP, 2012)

- Multiple definitions of green jobs

*"Decent jobs that contribute to **preserving or restoring the environment**, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency. Green jobs help to improve efficiency in the use of energy and raw materials, limit greenhouse gas emissions, minimize waste and pollution, protect and restore ecosystems, and support adaptation to the effects of climate change" (ILO, 2016).*

- Common understanding allows policy makers to identify necessary interventions

Work Tasks for Green Occupations



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- Engineering and technical skills
- Science Skills
- Operation management skills
- Monitoring Skills
- Transversal Skills: soft skills, “skills for the future”, skills related to design thinking, creativity, adaptability, resilience, and even empathy.

(adapted from UNIDO, 2022; Vona et al. (2015))

Climate relevant jobs



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- Net zero requires changes in **every sector of the economy**
- **New jobs** will be created
- Certain jobs will be **eliminated**
- Jobs will be **substituted**
- Most jobs will be **transformed**

(Auktor, 2021)

Reskilling & Upskilling



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- Green skills can help determine the **degree of re-training** needed
- Occupations exhibit higher levels of **task complexity** and **exposure to new technology**
- **Tailoring training & education programs** to the skills needs (new skills & upskilling)

Transdisciplinary Learning



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Learning is a process of **cognitive changes** and does NOT necessarily lead to behaviour change

- **real-world** problems
- acknowledges **context-dependencies** related to these problems
- knowledge from **different domains**, inside and outside academia
- aims to contribute to **solving concrete real-world problems**
- aims to generating **scientific insights** beyond these problems

(Barth, et al. 2023)

Enable Deliberate Transformation



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- Actors need to be prepared to **adapt to new challenges**
- Fundamental system change is about “**learning how to learn**”
- Generation of strong actors from different backgrounds can be strengthened by **transdisciplinary processes**
- Need to **create spaces** in which transdisciplinary learning can take place

(Barth et al., 2021)

Real-world Challenges



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- Real-world labs which **explore societal challenges**
- Challenge-led approach
- Requires the **recognition of complexity**
- **Multi-layeredness** when multiple stakeholders are engaged

(Baumber, 2022; Scholz & Steiner, 2015)

Real-world Labs



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Team Building



Pitching



Real-world Labs



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Transformative Action



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- **Transformative learning:** involves the transformation of one's beliefs through critical assessment
- **Global urban challenges** foster intellectual curiosity and the development of sustainable solutions through collaborative approaches
- The strength of **different disciplines** is drawn upon and **complex problems** are tackled from a holistic perspective
- Fostering **Green Skills** can act as a lever for change



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References

- Auktor, G. (2021). Green Industrial Skills for a Sustainable Future. Available at https://www.lkdfacility.org:9000/wp-content/uploads/2022/09/LKDForum-2020_Green-Skills-for-a-Sustainable-Future.pdf
- Barth, M., Jiménez-Aceituno, A., Lam, D. P. M., Bürgener, L., & Lang, D. J. (2023). Transdisciplinary learning as a key leverage for sustainability transformations. *Current Opinion in Environmental Sustainability*, 64. doi:10.1016/j.cosust.2023.101361
- Baumber, A. (2022). Transforming sustainability education through transdisciplinary practice. *Environ Dev Sustain*, 24(6), 7622-7639. doi:10.1007/s10668-021-01731-3
- Cedefop (2012), Green skills and environmental awareness in vocational education and training, Publications Office of the European Union, Luxembourg, June
- European Commission (2019), The European Green Deal, Communication, COM(2019) 640 final, Brussels, 11 November
- European Commission (2022), Green Skills and Knowledge Concepts: Labelling the ESCO classification, ESCO Publications, January.
- International Labour Office (ILO) (2016). Technical paper. A just Transition to climate-resilient economies and societies: Issues and perspectives for the world of work (Geneva). Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---gjp/documents/publication/wcms_536552.pdf
- Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., . . . Thomas, C. J. (2012). Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science*, 7(S1), 25-43. doi:10.1007/s11625-011-0149-x
- UNIDO (2022). What are green skills? Available at <https://www.unido.org/stories/what-are-green-skills>
- Scholz, R. W., & Steiner, G. (2015). The real type and ideal type of transdisciplinary processes: part I—theoretical foundations. *Sustainability Science*, 10(4), 527-544. doi:10.1007/s11625-015-0326-4
- Vona, F., G. Marin, D. Consolin, and D. Poll (2015). Green skills. NBER Working Paper No. 21116. Cambridge US: National Bureau of Economic Research