Designing educational offers for nature conservation in the 21st century – Concepts and examples

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The protection and sustainable development of biodiversity has become a priority since the turn of the century. The field has undergone far-reaching professionalization, with numerous new vocational opportunities now available. The required skills are extensive (see e.g. Appleton 2016, Maggs et al. 2021). Since traditional training programs do not adequately meet the demand, a variety of specialized training programs have developed worldwide. The main focus is on teaching skills and empowerment, while specific knowledge content is increasingly available in diverse online resources (literature, apps, guidelines, MOOCs, etc.).

Carinthia University of Applied Sciences is an Austrian institution that offers a range of new training courses addressing these growing needs. One primary focus is on the integration of digital technologies in conservation work. Disruptive technologies, artificial intelligence (AI), geoinformatics, remote sensing, robotics, sensor technology and data science are fundamentally changing the workflow and management in protected areas (PAs) (Dalton et al., 2021). New methods of optical or acoustic species recognition and genetic methods (e.g. barcoding, eDNA, etc.) are revolutionizing the documentation of species and are making even difficult species groups „easier" to access (see e.g. Pascher et al. 2022).

These developments have significant implications for the practical implementation of conservation measures, such as requirements around construction sites or infrastructure projects (Wiegele et al., 2022). These measures need to be taught using real-world examples. Nature conservation work, especially the management of PAs, is proving to be a complex task realized through balancing conflicting interests. Communication, transcultural and mediation skills are required here. These can only be acquired to a limited extent from literature and documents, but are truly developed through experience and reflection in the context of real-world applications. This requires new, interactive, and participatory competence-oriented forms of learning and teaching and corresponding didactic formats (see e.g. Rauch et al. 2021).

Outside of formal learning environments, these new forms of learning include experimental formats such as citizen science (see e.g. Jungmeier & Fuchs 2020) or games and gamification (Fuchs et al. 2021). In addition, project-based, experimental, and informal formats are becoming increasingly important. Selected examples are shown in this poster.

International Master Program: Management of Conservation Areas

All that one needs to know about conservation areas, their preparation, planning, and management is provided in this comprehensive master program. The unique educational offer shall enable participants to achieve conservation goals effectively, use new ways of communication, and engage stakeholders in a better way.

- Title: Master of Science "Management of Conservation Areas"
- ECTS: 120 ("Full master")
- Duration: 2 years, part-time (64 days of attendance in 4 blocks), blended learning
- Link: https://fh-kaernten.at/mca

Certificate: Nature Conservation Engineer

How are nature conservation measures at extraction sites to be implemented? How can optimal breeding facilities for different species be provided? How are invasive species or communal green areas to be managed? How are conservation devices such as amphibian fences or nesting boxes constructed and operated? The newly developed job profile of a 'Nature Conservation Engineer' embodies the competence for all hands-on conservation issues that occur on construction sites, infrastructures and in developed areas.

- Certificate: Professional Certificate issued by Carinthia University of Applied Sciences
- ECTS: 30
- Duration: 1 year, part-time (30 days of attendance)
- Link: https://fh-kaernten.at/nsfk

Certificate: *e*Taxonomist

In this course participants will learn how to assess biodiversity using modern technology, based on AI. Participants will get an overview of the range of identification technologies, in particular their fields of application, reliability and technical maturity. They learn to apply and use selected identification technologies and apps. These technologies include, for example, optical and acoustic sensors, reporting and observation platforms (e.g. observation.org, iNaturalist or SMART) or the BioMONITec etoolkits.

- Certificate: eTaxonomist - Certified expert for AI-assisted species identification
- ECTS: 30
- Duration: 1 year, part-time (30 days of attendance)
- Link: https://fh-kaernten.at/unesco-chair

Unconventional transdisciplinary formats

Transdisciplinary formats aim at collaboration between scientists and non-scientific stakeholders from different fields of practice. In doing so, new opportunities for joint reflection and co-creation of new robust knowledge emerge. The learning opportunities exist here for academia, students, and practice partners alike. Currently, the following formats are being tested:

- Science_Linknockberge: collaborative development of research questions with UNESCO biosphere stakeholders, multidisciplinary scientists and students (Egner et al. 2017)
- expedition.nationalpark: Scientists and locals explore the region of the Hohe Tauern National Park Carinthia together.
- CoMon: Collaborative monitoring of Eichhornia crassipes in the UNESCO biosphere park Lake Tana in Ethiopia (Car et al. 2022).

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