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| **Projekttitel** | **Change Through Education? How Teachers Can Transform Societal Perception of Biodiversity** |
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## Abstract

Biodiversity loss represents one of the most pressing global challenges, as ecosystems whichare rich in biological diversity provide essential services and long-term benefits for humanity(IPBES, 2019). Despite extensive national and international efforts, public understanding ofbiodiversity remains limited and is often accompanied by misconceptions regarding itssignificance and the threats it faces (European Commission, 2019; GFS Zürich, 2023). Thisknowledge gap weakens society's ability to make informed decisions and adopt behaviors thatsupport biodiversity conservation and sustainable development.

Formal education plays a crucial role in addressing biodiversity illiteracy, yet current Swisscurricula and teacher-training programs do not systematically integrate biodiversity content.Research indicates that a lack of conceptual understanding—including knowledge of geneticand ecosystem diversity or human-driven species decline—significantly hampers effectivesocietal responses to biodiversity loss (IPBES, 2024; Liu et al., 2022). While short-terminterventions have been shown to enhance biodiversity awareness (e.g., Schneiderhan-Opel &Bogner, 2020), the current curriculum for the German-speaking part of Switzerland (LP21) andteacher education programs lack a coherent and progressive framework for integratingbiodiversity education across all compulsory school cycles.

Teachers serve as key mediators of scientific knowledge and require both strong contentknowledge (CK) and pedagogical content knowledge (PCK) to effectively teach biodiversitycompetencies. Given that biodiversity is a socioscientific issue with ecological, economic,ethical, and political dimensions (Sadler, 2004; Zeidler & Sadler, 2007), educators must beequipped to navigate both scientific principles and broader societal debates. Without adequatetraining and resources, opportunities to foster biodiversity literacy in young learners are lost.To address these challenges, this project adopts an innovative, transdisciplinary approach todeveloping, implementing, and evaluating research-based teacher-training concepts (TC) andcurriculum-aligned learning arrangements (LA) designed to strengthen biodiversity literacy fromprimary through lower-secondary education. A key element of this initiative is a robustcollaboration among 11 Universities of Teacher Education (UTEs) and an advisory soundingboard composed of biodiversity scientists, practitioners, and policymakers, ensuring bothscientific rigor and societal relevance. By enhancing teacher training and curriculum integration,this project aims to provide a scalable model for fostering biodiversity literacy and equippingfuture generations with the knowledge and skills necessary to engage in sustainable biodiversityconservation efforts.

**Overall Objectives**

In addition to revolutionizing biodiversity education in Switzerland, we aim to address thefollowing key research questions: How does targeted teacher training on biodiversity affect (i)teachers' competencies and instructional practices in compulsory education, and (ii) theresulting biodiversity knowledge, attitudes,

and behavioral intentions among school students,thereby contributing to enhanced biodiversity literacy in society? Furthermore, we aim to (iii)specifically investigate how biodiversity knowledge influences students' and pre-service-teachers' attitudes toward and behavioral intentions regarding biodiversity conservation.

**Specific Aims**

1.Create a progressive competency framework aligned with LP21.

2.Develop and pilot research-based training concepts (TC) to strengthen teachers' CK/PCK and reflective practices.

3.Produce curriculum-aligned learning arrangements (LA) for primary and lower-secondary levels, ensuring progression in biodiversity understanding.

4.Evaluate intervention impacts via controlled pre-, post-, and follow-up assessments, including waitlist control groups.

5.Foster longterm sustainability by establishing a biodiversity literacy monitoring system and engaging key stakeholders for nationwide scaling.

**Methods**

1.Framework Co-Creation: Define competence goals for students and teachers viatransdisciplinary collaboration with UTEs and an expert Sounding Board.

2.Educational Design Research: Iteratively develop and test teacher training concepts (TC) andclassroom learning arrangements (LA), embedding reflective tasks and field-based activities(e.g., biodiversity mapping).

3.Mixed-Methods Evaluation: Conduct pre-, post-, and follow-up assessments (with wait-listcontrol groups) of CK, PCK, attitudes, and behavioral intentions. Complement with qualitativeclassroom observations, interviews, and focus groups.

4.Scaling & Monitoring: Refine TC/LA based on findings and disseminate materials via GLOBESwitzerland and UTEs. Establish a biodiversity literacy monitoring system for continuousevaluation and alignment with emerging scientific knowledge.

**Expected Results and Impact on the Field**

1.Evidence-Based Biodiversity Competency Framework: The project will deliver the firstcomprehensive, research-driven framework for biodiversity education across all compulsoryschool levels in Switzerland (and potentially throughout Europe).

2.Enhanced Quality and Consistency in Teacher Education: The co-developed teacher-trainingmodules will significantly improve teachers' scientific knowledge, pedagogical skills, andconfidence in delivering biodiversity lessons, thereby raising national standards in biodiversityeducation.

3.Empirical Insights into Teaching Effectiveness: Controlled studies will yield clear evidence ofthe impact of targeted teacher training on both teacher competencies and student learningoutcomes, as well as their attitudes and behavioral intentions towards biodiversity, informingfuture policy and curricular refinements.

4.Long-Term Societal Transformation: By fostering comprehensive biodiversity-literacy—including system-, target-, and transformation knowledge—the project

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| | aims toempower citizens to make informed decisions. The continuous monitoring system will supportevidence-based policy adjustments over time.<br><br>5.(Nationwide) Dissemination and Sustainability: Through strategic partnerships with GLOBESwitzerland, 11 UTEs, and governmental bodies (e.g., FOEN/BAFU), the validated modules andmaterials will be widely integrated into teacher education and school curricula, initially in theGerman-speaking regions and potentially nationwide.<br><br>By integrating cutting-edge scientific insights with state-of-the-art pedagogical strategies, thisproject directly addresses the root causes of biodiversity ignorance in formal education. It offersfundamental insights into the effects of teacher training on educational practices and studentoutcomes, ultimately shaping societal attitudes and behaviors toward biodiversity conservation.The project's innovative, transdisciplinary approach—supported by a broad coalition of UTEs,biodiversity experts, and other key stakeholders—lays a solid foundation for the effective andsustainable promotion of biodiversity competencies, marking a significant advancement inscience education research and ecological stewardship. |
| **Schlagworte** | Biodiversity Education; Teacher Education; Primary School; Secondary School; Societal Biodiversity Perception; Biodiversity Literacy; Compulsory Education |
| **Laufzeit** | 01. November 2025 bis 31. Dezember 2029 |

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