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TREEgital – digital knowledge transfer about forests for schools

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ABSTRACT

The COVID-19 pandemic has accelerated digitalization in education. The TREEgital project is taking advantage of this trend to use digital tools to impart forest knowledge in schools. It explores the forest as a living, recreational and economic space and emphasizes its role in protecting the climate and biodiversity. Key topics are biodiversity, climate change, and career guidance in green industries, all within the framework of Education for Sustainable Development (ESD). In addition, TREEgital teaches pupils digital skills.

Digital educational products for schools have been developed, such as the augmented reality app “Öswald - App in den Wald!”, which improves learning by overlaying virtual elements with real environments, and YouTube career guidance videos focusing on STEM topics. In the “TreeCast” video podcast, forest experts discuss topics ranging from climate change to soil health. The social media series “Ask the Expert” provides insights into the professional world of forest research.

TREEgital - Digitaler Wissenstransfer rund um den Wald für Schulen

ZUSAMMENFASSUNG

Die Covid-Pandemie hat die Digitalisierung im Bildungswesen beschleunigt. Das Projekt TREEgital macht sich diesen Trend zunutze, um mit digitalen Tools Waldwissen in Schulen zu vermitteln. Es erforscht den Wald als Lebens-, Erholungs- und Wirtschaftsraum und betont seine Rolle beim Schutz des Klimas und der biologischen Vielfalt. Zentrale Themen sind Biodiversität, Klimawandel und Berufsorientierung in grünen Branchen, alles im Rahmen der Bildung für nachhaltige Entwicklung (BNE). Darüber hinaus vermittelt TREEgital Schüler:innen digitale Kompetenzen.

Digitale Bildungsprodukte für Schulen wurden entwickelt, wie z.B. die AR-App „Öswald – App in den Wald!“, die das Lernen durch Überlagerung von virtuellen Elementen mit realen Umgebungen verbessert, und YouTube-Berufsorientierungsvideos mit Schwerpunkt auf MINT-Themen. Im Video-Podcast „TreeCast“ diskutieren Wald-Expert:innen über Themen vom Klimawandel bis zur Bodengesundheit. Die Social-Media-Serie „Ask the Expert“ gibt Einblicke in die Berufswelt der Waldforschung.

INTRODUCTION

TREEgital aims to make learning about forests, ecosystems, and related careers engaging and accessible, addressing the increased need for digital educational resources highlighted by the COVID-19 pandemic. The project provides digital materials for various school levels, focusing on biodiversity, climate change, and STEM career orientation. Its mission includes developing an augmented reality (AR) app, career guidance videos, a video podcast, primary school materials, an online course for linguistically sensitive teaching, and a social media series to integrate forest education into the classroom effectively.

INNOVATIVE DIGITAL PRODUCTS

1. **Augmented Reality App “Öswald – App in den Wald!”** This app immerses students in Austrian forests, using AR to overlay interactive maps, 3D simulations, quizzes, and storytelling elements (Figure 1, Figure 2). Designed for secondary school students, it includes pedagogical materials to help teachers integrate the app into lessons, covering topics like forest ecosystems, conservation, and environmental science. The app brings digital information into the real world, allowing students to explore forests through their smartphones, making learning interactive and engaging. By

KEYWORDS

- > environmental education
- > ESD
- > digital tools
- > augmented reality
- > biodiversity
- > climate change
- > forest
- > vocational guidance
- > inclusive education

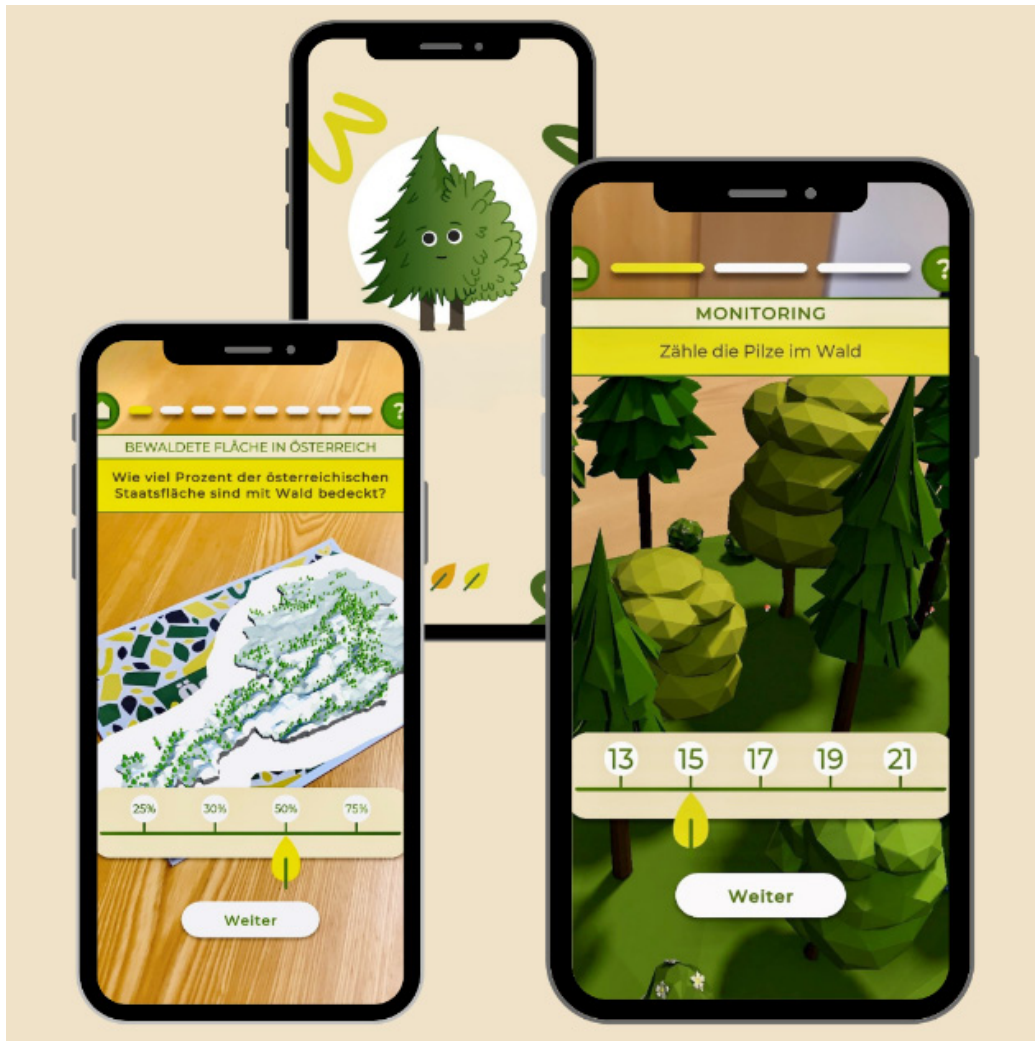


Figure 1:
Insight into the AR app
“Öswald - App in den
Wald!”

Abbildung 1:
Einblick in die AR-App
“Öswald - App in den
Wald!”

Fig. 1

scanning a reference image, users can activate AR features that display information blocks and quizzes related to forest ecosystems, conservation, and environmental science. This comprehensive tool includes three learning chapters with 3D simulations and storytelling elements.

- iOS version
- Android version

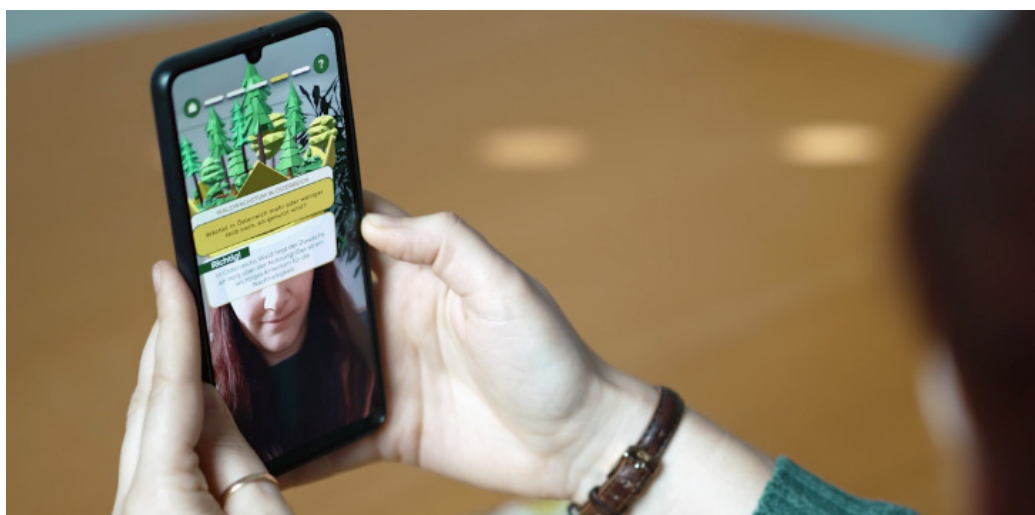


Figure 2:
If you correctly answer
quiz questions in selfie
mode, a tree crown
grows on your head!

Abbildung 2:
Beantwortet man Quiz-
fragen im Selfie-Modus
richtig, wächst eine
Baumkrone am Kopf!

Fig. 2

2. **Vocational Orientation Videos** showcase careers in forestry and related fields, featuring professionals like a GIS specialist, forest technician, ecological geneticist, and natural hazard expert (Figure 3). Each episode provides insights into their careers, educational backgrounds, and the societal impact of their work, aiming to inspire students to pursue STEM careers. For instance, the GIS specialist demonstrates the use of geographic information systems to map and analyze forest data for sustainable management, while the forest technician highlights the technical aspects of forestry, including operating advanced machinery. The ecological geneticist discusses research on genetic diversity in forest ecosystems, and the natural hazard expert addresses the assessment and management of natural hazards.



Figure 3:
Behind the scenes of
the production

Abbildung 3:
Hinter den Kulissen der
Dreharbeiten

Fig. 3

3. The **Video Podcast “TreeCast”** (Figure 4) features discussions with forestry and environmental science experts on topics like climate change, soil health, and biodiversity. Available on YouTube and Spotify, the podcast offers flexible learning for students and teachers. Each episode dives into specific environmental challenges and the latest scientific research, making it an ideal resource for both classroom and personal enrichment. The format allows listeners to access valuable information at their convenience, whether at home or in the classroom.

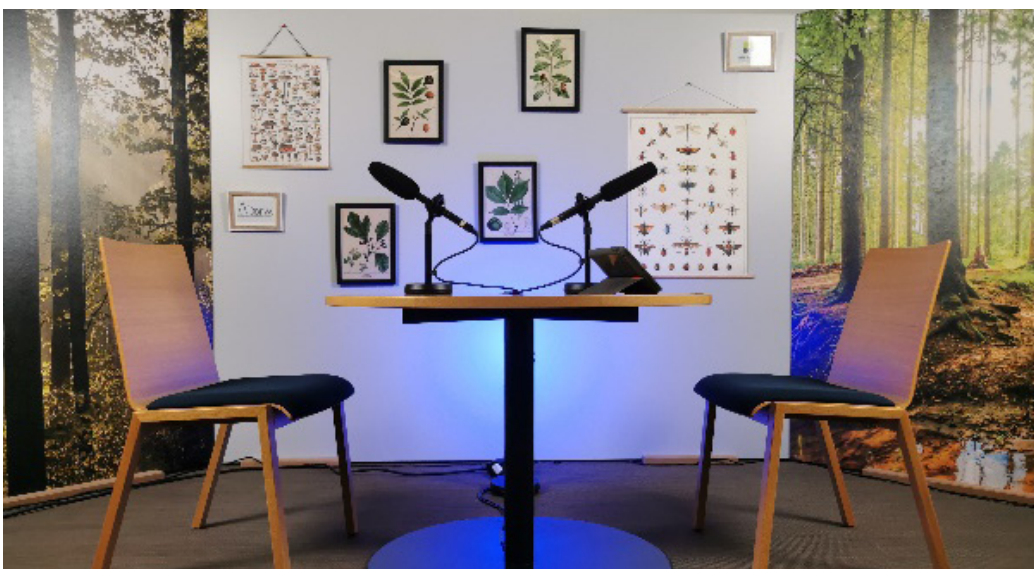


Figure 4:
Behind the scenes
of the video podcast
shooting

Abbildung 4:
Hinter den Kulissen
der Dreharbeiten zum
Videopodcast

Fig. 4

4. **Primary School Material: “Wald 3D: outDoor, inDoor, Digital”** is designed for primary school children in grades 2-4. This resource integrates outdoor experiences, classroom learning, and digital elements to teach biodiversity and environmental awareness. It includes lesson plans, worksheets, and activities that emphasize practical exercises and the use of digital tools. The material consists of three units with detailed lesson plans, incorporating observation in nature, STEM subjects, and digital tools to enhance students’ understanding of biodiversity.
5. **Biodiversity Online Course for Linguistically Sensitive Subject Teaching:** This course supports teachers in delivering biodiversity and climate change content to secondary-level students who speak German as a second language. It includes strategies, resources, and activities to help all students understand scientific concepts, promoting inclusive education. Structured into four modules, the course covers different aspects of forest biodiversity and provides instructional strategies, background information, lesson plans, and classroom activities. This ensures that teachers can tailor the content to meet the diverse needs of their student populations, making science concepts more accessible and engaging for all learners.
6. The **Social Media Series #AskTheExpert** connects students with professionals in ecology and forestry through short, informative videos. Available on various social media platforms, the series simplifies complex topics and encourages engagement through likes, shares, and comments. The series features expert profiles, educational content, and interactive elements, fostering a community of environmental enthusiasts and inspiring students to pursue environmental careers by connecting them with role models.

CONCLUSION AND KEY MESSAGES

TREEgital uses digital media to promote understanding and appreciation of forests as essential ecosystems, fostering sustainable thinking and environmental stewardship among students. By combining digital innovation with hands-on learning, the project highlights the role of intact forests in combating climate change and conserving biodiversity. It makes forest ecosystems accessible through digital tools, encouraging student engagement with environmental and vocational issues. This pioneering approach equips students with the knowledge and skills necessary to take responsibility in a globalized world.

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