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From Open License to Transformation

OERs as Strategic Infrastructure for the UN 2030 Agenda

Sandra Schön, Martin Ebner & Dominik Ruffeis, TU Graz

7th WORLD SYMPOSIUM ON SUSTAINABLE DEVELOPMENT AT UNIVERSITIES (WSSD-U-2026), Friday, 4th of September, Innsbruck/Austria

TU Graz

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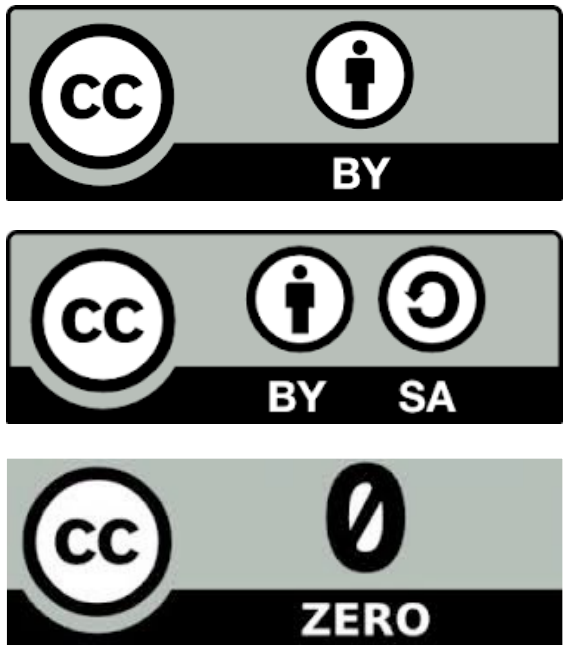
Open Educational Resources (OERs)

.. are educational content, materials and software where it is allowed to re-use, adapt, modify and re-publish even for commercial purposes.

Therefore, open licenses are needed in most countries worldwide*.



*Some countries allow “public domain“ dedication (USA). The EU does not — making open licences essential there.

UNDERSTANDING AND OPPORTUNITIES OF OER



educational resource creator uses open licenses





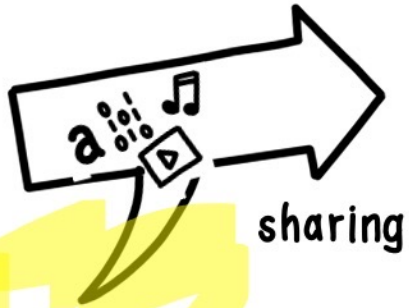


refers to a licence text (a contract)

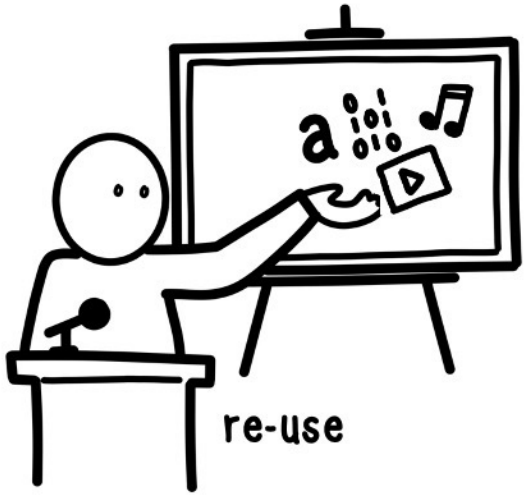


OPEN EDUCATIONAL RESOURCES





sharing



re-use

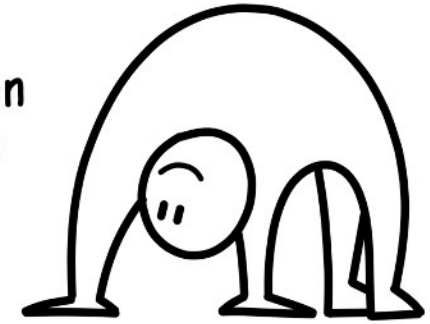
revision



inclusion



base and result of open educational practices



simplified cooperation



CC0 (Sandra Schön)

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Are

Open Educational Resources (OERs)

socially

financially

enviromentally

sustainable
(as understood in the UN Agenda)

?

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Research Questions

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1. How do OERs contribute to social sustainability by removing barriers to access, enabling inclusive content production, and fostering community resilience?
2. In what ways do OERs support economic sustainability through cost reduction, scalable reuse, and the stimulation of innovation in educational ecosystems?
3. What are the pathways through which OERs contribute to environmental sustainability, particularly via dematerialisation and resource-efficient learning modalities?

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Approach

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- Structured insights from projects from the Austrian higher and adult education context
- Evidence from existing project evaluations
- Data sources include quantitative usage metrics (downloads, registrations, active users) extracted from platform analytics, cost-benefit calculations derived using standard market rates, and qualitative data from evaluation reports, survey feedback from learners and creators, and case study documentation.

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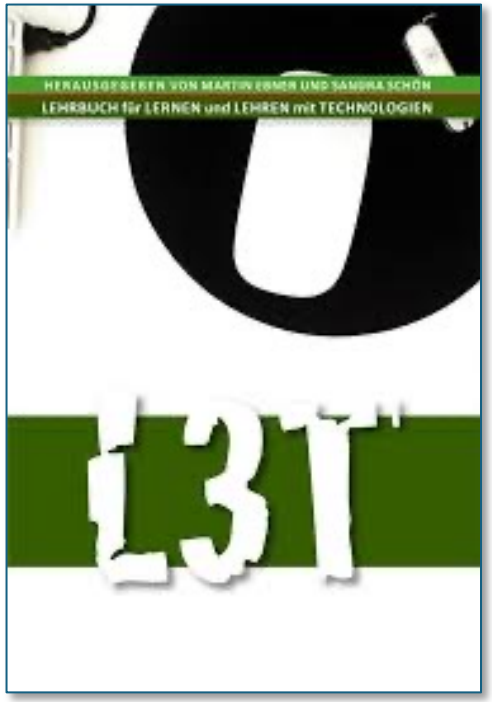
Textbook project “L3T”

- Textbook ”Lehrbuch für Lernen und Lehren mit Technologien” (about e-learning research)
- with over 50 chapters
- last issue 2013, updated and extended in a hybrid, distributed booksprint process with 250 people involved in 7 days (August 2013)
- published under CC BY-SA 4.0#
- l3t.tugraz.at



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Valuation of social (& economic) benefits of 11 weeks of "L3T"

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Metric	Value Generated by L3T
Digital Reach	18,431 accesses on chapter abstracts; 21,631 PDF downloads; 6,842 views via SlideShare
Cost Savings for Users/Library	Approximately 9,000 accesses to at least one chapter PDF (heuristically estimated)
Hypothetical Purchase Avoidance	If 1 in 5 users: €106,200 saved; If 1 in 10 users: €53,100 saved; If 1 in 100 users: €5,310 saved
Advertising Equivalent Value	€590 (based on 12.50 TKP for banner advertisements)
Public Relations Value	€6,080 (4 regional newspaper articles at €200 each + 31 postings in relevant scientific/community weblogs at €80 each + 28 scientist blog posts at €100 each)
Total Identified Value	€108,870 or more (conservative estimate combining PR and lowest purchase avoidance)

Schön, S.; Ebner, M. & Lienhardt, C. (2011). Der Wert und die Finanzierung von freien Bildungsressourcen. In: Meißner, K. & Engelien, M. (eds.), Virtual Enterprises, Communities & Social Networks, Proceedings der GeNeMe, Dresden: TUDpress, 239 – 250.

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Austrian national MOOC platform ”iMooX.at”

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- Online Course platform, xMOOX format
- Open for all, for free, and under CC- licenses
- GDPR conform (no commercial usage of data)
- Courses from Austrian higher education institutions (and from other countries) – university quality
- Multilingual
- iMooX.at

iMooX

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Social (& economical) effects of iMooX.at

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Table 2. Selected Reasons for preferring online courses among iMooX participants (n=13,188). Source: Schön et al. (2024)

Reason	Percentage of Participants
Works	58%
Place where I live	38%
Caregiving responsibilities	24%
Physical disability	10%

93,491 registered users in three years (Ebner et al., 2026, p. 13), assuming a conservative market rate of 100 € per MOOC: total value delivered 9.3 million € in avoided costs for users.

Schön, S., Ebner, M., Mair, B., & Edelsbrunner, S. (2024). Online-Lernort iMooX.at: neun Jahre Onlinekurse auf der nationalen österreichischen MOOC-Plattform. Die österreichische Volkshochschule, 74(281). https://magazin.vhs.or.at/magazin/2023-2/281-winter-202324/schwerpunkt-lernraeume-und-lernorte/online-lernort-imooox-at-neun-jahre-onlinekurse-auf-der-nationalen-oesterreichischen-mooc-plattform/

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Social effect: OER as legal base for inclusion

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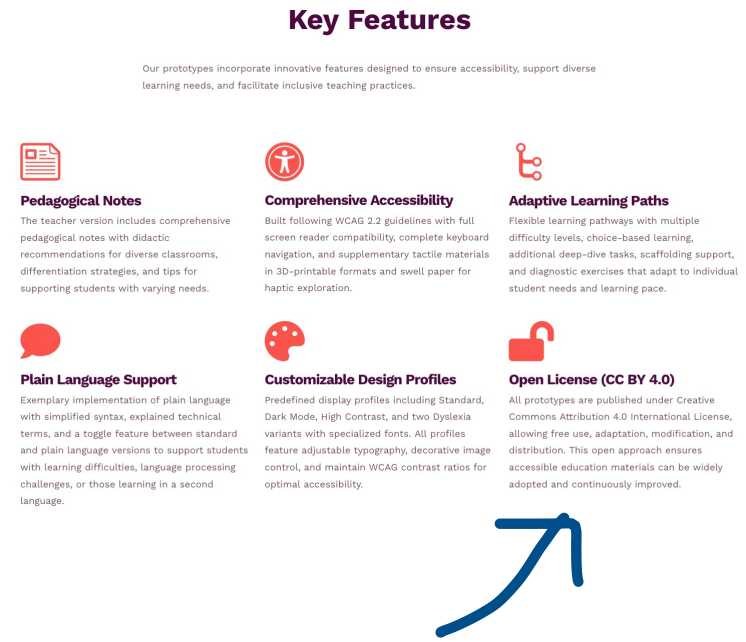
- Project “Digital Education Media”
- https://www.dem-project.eu/
- To adapt educational material we need open licenses (and open formats)



Key Features

Our prototypes incorporate innovative features designed to ensure accessibility, support diverse learning needs, and facilitate inclusive teaching practices.

Pedagogical Notes
The teacher version includes comprehensive pedagogical notes with didactic recommendations for diverse classrooms, differentiation strategies, and tips for supporting students with varying needs.

Comprehensive Accessibility
Built following WCAG 2.2 guidelines with full screen reader compatibility, complete keyboard navigation, and supplementary tactile materials in 3D-printable formats and swell paper for haptic exploration.

Adaptive Learning Paths
Flexible learning pathways with multiple difficulty levels, choice-based learning, additional deep-dive tasks, scaffolding support, and diagnostic exercises that adapt to individual student needs and learning pace.

Plain Language Support
Exemplary implementation of plain language with simplified syntax, explained technical terms, and a toggle feature between standard and plain language versions to support students with learning difficulties, language processing challenges, or those learning in a second language.

Customizable Design Profiles
Predefined display profiles including Standard, Dark Mode, High Contrast, and two Dyslexia variants with specialized fonts. All profiles feature adjustable typography, decorative image control, and maintain WCAG contrast ratios for optimal accessibility.

Open License (CC BY 4.0)
All prototypes are published under Creative Commons Attribution 4.0 International License, allowing free use, adaptation, modification, and distribution. This open approach ensures accessible education materials can be widely adopted and continuously improved.

Screenshot: https://www.dem-project.eu/prototypes/

Brnic, M., Degenhardt, S., Edelsbrunner, S., Erdei, T., Greefrath, G., Kargl, B., Lathan, H., Macchia, V., Mönter, L., Schön, S., Schütt, M.-L., Torri, S., Wetzel, M., & Ebner, M. (2025). A digital textbook for everyone: Accessible and interactive, from concept to use. CDV. https://doi.org/10.5281/zenodo.18313228

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Social effect: Community engagement

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- ebMOOC series by Conedu and partners at iMooX.at
- Online courses for adult education trainers as “Inverse blended learning”
- Several parallel meetings and trainings in brick and mortar settings
- Austrian’s biggest adult education event/training!
- First run in 2017: >40 learning groups across Austria, 3,064 registered users, 48 percent of active learners obtained a certificate (at a MOOC!), among those who joined a local group, 82 per cent stayed until the end



Aschemann, B. (2017). Die digitale Bereitschaft der Erwachsenenbildung. Der EBmooc für Erwachsenenbildnerlnnen. In: Magazin erwachsenenbildung.at. Ausgabe 30, Wien. Online: https://erwachsenenbildung.at/magazin/17-30/meb17-30.pdf

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Financial effects: Some (more) examples

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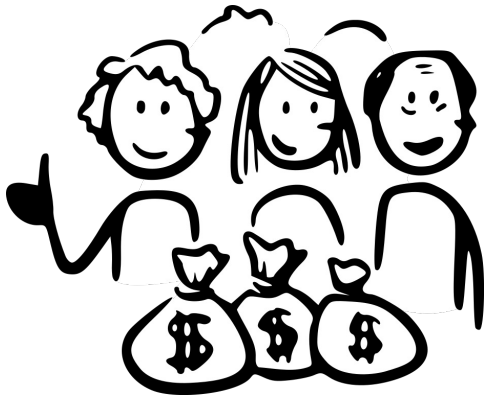
- **Cost Reduction Through Collaborative Production:** Southeast Austrian University Network for Teacher Education made a central MOOC for eight universities as part (Ebner et al., 2020).
- **Scalable Reuse and Localisation** (example OER course for university alliance Unite!)
- **New Business Models and Teaching Scenarios:** At TU Graz microcredential for paying participants fund MOOC (OER)



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Eviromental outcomes: General comment

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- **Reducing ecological footprint**: reduced costs for printing (footprint!) and mobility if digitally used; but it can be printed (=as often it is needed)
- (We could not find figures/estimations on this argument)



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Discussion: Simple Result

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Open Educational Resources (OERs) are socially financially enviromentally sustainable (as understood in the UN Agenda)!

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Discussion: Core arguments

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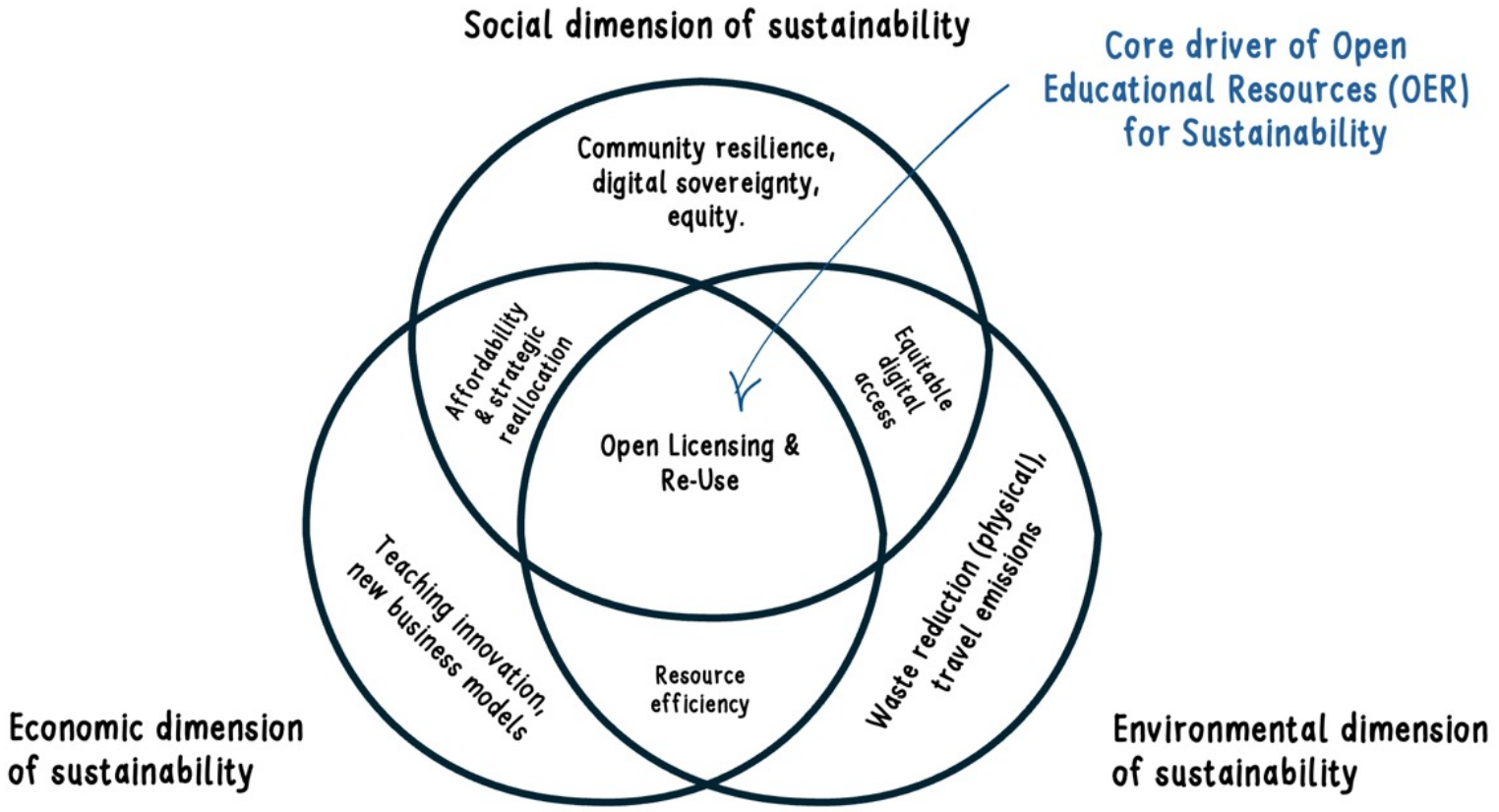

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Discussion: Interconnected sustainabililty mechanism of OER

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Table 3. Interconnected sustainability mechanisms of OERs

Mechanism / Lever	Primary Social Impact	Primary Economic Impact	Primary Environmental Impact
No License Fees / Free Access	Equity: Enables access for income-restricted groups; democratizes knowledge.	Efficiency: Saves institutional budgets; allows reinvestment in pedagogy.	Logistics: Often favours digital distribution, avoiding heavy print/transport chains.
Reusability (Adapt/Reuse)	Inclusion: Allows adaptation for diverse needs (languages, disabilities, local contexts).	Scalability: 'Produce once, (re-)use many times'; avoids redundant production costs.	Waste Reduction: Prevents obsolescence; reduces physical waste from discarded editions.
Open Licensing (Legal Certainty)	Participation: Removes fear of litigation; fosters collaboration and community building.	Innovation: Lowers transaction costs; enables new business models	Digital Flow: Facilitates instant asset exchange without physical transfer.
Digitalization (Dematerialization)	Ubiquity: Global, immediate access independent of physical location or mobility.	Cost Avoidance: Drastically cuts printing, warehousing, and shipping expenses.	Resource Saving: Reduces paper consumption, ink, and CO_2 from global logistics.

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Outlook: OER in Austria's higher education landscape

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- **OER certificate for Higher education**
  - First country worldwide
  - https://www.oer-zertifikat.at/
  - 5 Certified OER Higher Education Institution including TU Graz (2025)
  - 388 certificates for person (25 hours effort, 3 OER)
- **OER is part of the Certificate for Higher Education Teaching in ESD** (Allianz Nachhaltige Universitäten in Österreich, 2026)

Schön, S., Ebner, M., Berger, E., Brandhofer, G., Edelsbrunner, S.; Gröblinger, O., Hackl, C., Jadin, T., Kopp, M., Neuböck, K., Proinger, J., Schmölz, A., & Steinbacher, H.-P (2023). Development of an Austrian OER Certification for Higher Education Institutions and Their Employees. In D. Otto, G. Scharnberg, M. Kerres, & O. Zawacki-Richter. (Eds.), Distributed Learning Ecosystems. Springer VS. https://doi.org/10.1007/978-3-658-38703-7_9.

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Outlook DigiSET project: A Digitally Sustainable Teacher Academy...

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- OER knowledge and production is a must
- OER is a fundamental base for trainings and materials
- Should include and argue social, financial and environmental aspects of OER (not only copyright)

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Want to learn more about OER?

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A **MULTILINGUAL** ONLINE COURSE **FOR ALL** AT IMOOX.AT:
https://imoox.at/course/OERinHE



MORE ABOUT THE UNITE! SEED FUND PROJECT
https://www.unite-university.eu/unitenews/unite-pioneers-open-science-and-multilingual-oer-courses

unite!

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THANKS

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