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EdTechnica: a vision of an educational publishing community of practice that is accessible, flexible, and just

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Abstract

Open Educational Resources (OER) and Open Educational Practices (OEP) have the potential to transform and positively impact individuals, institutions, and society. As educators, we have a unique responsibility to explore opportunities and possibilities afforded by openness enabled by current technologies to reimagine and reshape current educational reality and provide a more hopeful and equitable future for all. *EdTechnica* is an openly licensed living encyclopedia that provides background information on central topics and theories in the field of educational technology. As an OER, *EdTechnica* extends the 5Rs of openness—retain, reuse, revise, remix, and redistribute by also attending to the 3Rs of social justice—recognition, representation, and redistribution—bringing about a responsive product that reimagines what encyclopedias should be. Additionally, the governing board enacts principles of openness in its practice, striving for OEP in all its activities. This article explores how *EdTechnica* promotes knowledge creation and academic discourse by attending to key principles of openness in terms of ensuring accessibility, flexibility, justice, and sustainable generosity. Specific examples of OER/P in the *EdTechnica* context offer an insight into our practices and ambitions to improve the current educational landscape, illustrating what is possible at the intersection of justice, hope, and educational technology when we strive for openness and are guided by the values of sustainable generosity and sustainable improvement.

Keywords: Educational technology, Openness in education, Open educational resource, Open educational practice, Accessibility, Flexibility, Justice, Sustainable generosity

Hope lies in dreams, in imagination, and in the courage of those who dare to make dreams into reality
– Jonas Salk

Introduction

In the evolving academic landscape, discussions frequently orbit the potential of Open Educational Resources (OER) and Open Educational Practices (OEP) alongside the challenges these initiatives encounter. Such discussions and discourse often do not translate into tangible outcomes and remain rhetoric, leaving a gap in real-world applications and exemplary role models. As we reimagine technology in higher education and reflect upon the possibilities that openness brings to higher education at the intersection of justice, hope, and educational technology, we ask, 'Could we offer a practical example serving as a beacon of hope in the academic landscape and provide guidance and inspiration for the development of future practices?' This theoretical paper proposes to bridge the theory–practice divide by showcasing *EdTechnica*, an openly licensed encyclopedia of educational technology and a living embodiment of the principles and promises of OER and OEP. By exploring the case of *EdTechnica* through the prism of accessibility, flexibility, justice, and sustainable generosity, this case aims to illustrate how OER and OEP can intersect with justice, hope, and educational technology in knowledge, theory, and practice. Through this prism, we seek to provide a concrete example to serve as a foundation for developing future educational practices, moving beyond speculative dialogue to actionable insight.

Educational problems and barriers

Globally, rising education costs, limited access to quality educational resources, and restrictive academic publishing structures present significant challenges and emerge as serious problems to overcome (Hodgkinson-Williams & Trotter, 2018). These factors, compounded by socioeconomic, geographic, and institutional barriers, hinder access to current academic discussions and materials (Pete, 2019) and further negatively impact the quality of teaching, learning, and research. Moreover, the need for flexible publishing to accommodate rapid knowledge evolution and improve accessibility, particularly for marginalized groups, indicates the urgency and need for equitable solutions in the educational landscape (Bozkurt et al., 2023).

Undoubtedly, the nature of educational problems and their potential solutions significantly differ, reflecting the varying degrees of access to resources, infrastructure, and educational needs faced by various regions. However, Open Educational Resources/Practices (OER/P) have the potential to transform and positively impact individuals, institutions, and societies globally (Kimmons & Irvine, 2023). As educators, we have a unique responsibility to explore opportunities and possibilities afforded by openness enabled by current technologies to reimagine and reshape current educational reality and provide a more hopeful and equitable future for all.

Openness as a tangible practice

OER/P are founded on the concept of openness in education with the underlying philosophy that *the world's knowledge is a public good* that could be and should be shared,

used, and reused with the assistance of technology (Smith & Casserly, 2006). Broadly, the philosophy of openness is an empathic response to the field that values principles of transparency, access, participation, and democracy. It acknowledges our past and attempts to use the present to provide responsible solutions for the future. In particular, openness refers to the "accessibility of knowledge, technology, and other resources; the transparency of action; the permeability of organisational structures; and the inclusiveness of participation" (Schlagwein et al. 2017, p. 297). Open terminology is multidimensional and refers to the higher order concepts (e.g. philosophy of openness), the nature of resources (e.g. open educational resources), the nature of processes (e.g. open educational practices), and even to the effects on specific domains (e.g. open education) (Schlagwein et al. 2017). Openness in education is part of a complex, interrelated set of systems guided by the philosophy of openness, involving teaching and learning, focusing on learners being at the center of the learning process, and striving for accessibility, transparency, and democratization (Bozkurt & Stracke, 2023).

However, any change from established practices, such as adopting OER/P, can be an arduous and lengthy process that requires a systematic and systemic approach to transformation, visionary exploration, prototyping in situ, and enthusiastic advocacy (Bossu & Ellis, 2023; Bozkurt & Stracke, 2023; Marín et al., 2022). Examining authentic examples of effective tools and practices aids our understanding of their application and implementation across various contexts and assists in their successful adoption. This article features *EdTechnica* and its governing board's practices to showcase how openness can be enacted through principled and innovative efforts at the intersection of justice, hope, and educational technology. Written by the governing board members and supporting editors, this theoretical piece explains our vision of how *EdTechnica* promotes knowledge creation and academic discourse for all by attending to key principles of openness in terms of ensuring accessibility, flexibility, justice, and sustainable generosity. This framework presents specific examples of OER/P from *EdTechnica* as an insight into our practices, tangible outcomes, and ambitions to improve the current educational landscape, illustrating what is possible when we strive for openness and are guided by the values of sustainable generosity and sustainable improvement (Kimmons & Irvine, 2023).

Open educational resources and open educational practices

Traditionally, academic outputs, such as journal articles, books, book chapters, encyclopedias, or textbooks, have been controlled by publishers who copyright and monetize academic discourse. As a result, most academic literature is placed behind paywalls, limiting access to those with institutional or financial resources. These practices can also affect who is able to participate in the development of knowledge, as participation in academic discourse requires being connected to as well as being acknowledged by those who control this discourse. OER/P attempts to break down these power structures by intentionally increasing access to participation in academic discourse development and the resulting publications.

UNESCO (2019) defines OER as "learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that has been released under an open license, that permits no-cost access, re-use, re-purpose, adaptation and redistribution by others." The five Rs or permissions established by Wiley (2014)

are often used to designate OER, enable open pedagogical practices (Wiley & Hilton, 2018), and are manifest in Creative Commons licenses as follows:

1) Retain – the right to make, own, and control copies of the content;
2) Reuse – the right to use the content in a wide range of ways;
3) Revise – the right to adapt, adjust, modify, or alter the content itself;
4) Remix – the right to combine the original or revised content with other open content to create something new; and
5) Redistribute – the right to share copies of the original content, your revisions, or your remixes with others.

These tenets guide not only academic practices but worldly decisions whereby past understandings were financially and socially controlled. Although many agree on the benefits of publishing under an open license, it is critical to recognize potentially negative impacts when these permissions are misused or misapplied. Instances, where knowledges that have foundations in *other* religions, cultures, or races are only recognized when appropriated, set the principle for creation and dissemination practices. Through OEP, there is an opportunity to reset practices and correct ways of thinking—a new research path for the field to test.

Critical scholars of openness in education have emphasized the importance of moving beyond content availability to building open educational practices, OEP (Cannell et al. 2015; Cronin, 2020; Lane, 2016). The focus has shifted from resources to practices and processes, emphasizing the importance of collaborative engagement between learners and teachers in knowledge creation and sharing (Cronin et al. 2023). Although OEP conceptualizations vary widely and continue to evolve, the underlying values align with the open education values more broadly, specifically, "enabling educational access, ensuring inclusivity, and furthering equity" (Cronin et al. 2023, Abstract). By definition, OEP can be considered "an umbrella term that includes the creation, use, and reuse of open educational resources (OER); pedagogical practices encouraging peer learning, collaborative knowledge creation, sharing, and empowerment of learners; and systemic and structural initiatives to support and embed openness," all with the intent of drawing from the foundational truth of knowledge—key to the validity and reliability of the field (Cronin et al. 2023, p. 1).

Sharing practices

Two noted benefits of OER are reducing the cost for students and improving access to media resources, particularly educational materials and content (Watson & Rush-Marlowe, 2023). Traditional educational materials, such as textbooks, can be expensive, especially for students who are already struggling to pay for tuition, housing, and other expenses. OER can be accessed and used at a reduced cost, allowing students to save money and use learning materials from the first day of class, positively impacting retention and completion rates (e.g. Fischer et al. 2021; Hilton et al. 2019, 2020). OER can also improve access to education and educational materials on an international level for those who traditionally have had limited access due to varying constraints or lack of physical resources. Through OER, educational materials can be accessed anywhere

and anytime with a connected digital device, potentially reducing traditional geographic and socioeconomic barriers to education and promoting lifelong learning opportunities (Ossiannilsson, 2019).

The greatest potential of OER/P, however, lies in exploring practices and pedagogies made uniquely possible and practical in the context of openness. Adopting OER/P allows educators to use and adapt existing resources and create materials tailored to their students' needs and aligned with their own pedagogical approaches. Furthermore, embracing OER/P as a pedagogical tool has the potential to increase cognitive engagement and meaningful interactions, introduce new ways of co-creation and sharing of knowledge, and foster collaborative work and learner empowerment (Bossu & Elis, 2023; Shareefa et al., 2023; Dickson-Deane & Edwards, 2021). This, in turn, can lead to the creation of new and/or better educational materials and practices and opportunities to contextually customize instructional materials and methods further for the benefit of learners (Dickson-Deane, 2023). Ultimately, such changes may bring about more inclusive, dynamic, and flexible educational structures engaged in an ongoing process of continuous improvement (Tlili et al., 2023; Bossu & Ellis, 2023; Wiley et al., 2021).

Digitizing hope

Despite the potential, there are also many challenges related to OER/P and barriers to their widespread adoption. Educators may be unfamiliar with the open license model and the processes of using and adapting OER (Kimmons, 2016). A limited understanding of open pedagogies, OER-enabled pedagogies (Wiley & Hilton, 2018), and more expansive OEP perspectives among educators (Kimmons, 2016) also hinders adoption. Ongoing training and support are needed to build individual and institutional capacity in OER/P (Bossu & Ellis, 2023). Specifically, educators worldwide would benefit from knowing how to adapt OER to fit their and their learners' needs, appropriately use copyrighted and CC-licensed materials, enact pedagogies uniquely enabled by OER, and adopt wider OEP. To encourage lasting change in attitudes, beliefs, knowledge, and practices, educators would benefit from seeing the value OER/P bring to them and their students—toward a more hopeful future. They also need to experience OER/P first-hand, see expected practices modeled, and closely collaborate with colleagues about the particulars of adopting these practices in their educational contexts (Borko et al. 2010). Other issues relate to governmental and institutional support for OER/P adoption, such as securing funding, taking into account cultural norms, and adjusting institutional policies. On this level, OER/P supports vary widely across countries and institutions, making it challenging to recommend uniform guidelines (Marín et al., 2022). Systemic efforts on micro, meso, and macro levels are needed using both top-down and bottom-up approaches as changes in the education sector are lengthy, arduous, and part of a complex and diverse ecosystem (Bossu & Ellis, 2023; Marín et al., 2022; Senge, 1990).

Digital technologies, and OER/P in particular, have the potential to be one of the main drivers for modernizing our current educational systems and catalysts for innovation and change (Bossu & Ellis, 2023; Ossiannilsson, 2019). Yet, openness through OER/P does not automatically ensure access, flexibility, and equity. Openness is neither a cure for all problems nor desirable and effective by default (Kimmons & Irvine, 2023; Schlagwein et al., 2017). Instead, we must recognize the values guiding openness, carefully consider how

we want to shape the future through OER/P, and be aware of the forces at play at different levels. Then, we can intentionally and reflectively engage ourselves in *innovative* practices offered by open technologies, explore and evaluate their impact and potential consequences to ensure openness without inadvertently perpetuating systemic injustices (Cronin et al., 2023; Kimmons & Irvine, 2023; Ossiannilsson, 2019; Veletsianos, 2021).

EdTechnica: the case

EdTechnica is an openly licensed encyclopedia of short, focused articles introducing basic concepts in educational technology and instructional design and can be accessed at www.edtechnica.org. *EdTechnica* and its governing board practices are examples of how the principles of accessibility, flexibility, justice, and sustainable generosity can be promoted through OER/P. Before we consider how these principles are enacted through *EdTechnica*, we will briefly describe the origins and intended purpose of the encyclopedia.

Recognizing the need for high-quality, up-to-date, and accessible content for teaching courses in educational technology and informing community understanding, the second author initially envisioned *EdTechnica* as a living volume of short articles that could provide an introduction to core concepts in the field. He wrote a proposal document and shared it with a network of contacts throughout the world via public social media hashtags and direct messages. He then thoughtfully incorporated feedback from this community in formalizing encyclopedia documentation and openly invited scholars to participate as part of the review board, especially encouraging participation from women and professionals outside North America. From this review board of approximately 40 people, nominations were solicited for a governing board of six scholars, and elections were held. The resulting governing board included a majority of women and a 50/50 split between North America and the rest of the world. The second author was elected to serve as the editor-in-chief for a specified three-year term, and a five-year plan was established. With the governing and review board in place and policies and procedures formalized, *EdTechnica* began soliciting and accepting proposals for articles.

Currently, *EdTechnica* features 1,000-word peer-reviewed articles intended to introduce students, researchers, fellow instructors, practitioners, and anyone outside the discipline to key concepts that are important in the field of educational technology and instructional design. The articles in *EdTechnica* range from learning and design concepts to emerging technologies, research methodologies, and policies shaping the future of educational technology. Articles do not represent only concepts specific to the field but also more general ideas, theories, and methods that are important in the field of educational technology, with an explanation of why they are important and how they are used. The encyclopedia is a living volume, which means that each article is "intended to provide an up-to-date understanding of the topic while also providing a space for community contributors to share helpful resources related to the topic" and to propose updates and revisions as needed (EdTechnica, 2022).

Reimagining the future: a model for accessible, flexible, just and sustainable practice

Although *EdTechnica* in itself is a valuable OER for the field of educational technology, the governing board takes openness a step further by striving to embody the values of openness in its community practices and development by aiming for OEP. As an OER/P, *EdTechnica* extends the 5Rs of openness—retain, reuse, revise, remix, and redistribute (Wiley, 2014) by also attending to Fraser's 3Rs of social justice—recognition, representation, and redistribution (Fraser, 2003), bringing about a responsive product that reimagines what encyclopedias and related publishing practices could be. This is because "realising the promise of OER is as much through the development of innovative social practice as through development of new content" (Cannell et al. 2015, p. 64) and through considering the social, political, and economic aspects of education (Fraser, 2003).

We recognize that Fraser's justice framework is viewed as feminist with deeply anti-capitalist sentiments. However, in this paper, we utilize it as a pragmatic tool for understanding and addressing real-world injustices caused by institutional arrangements related to educational technology access and use (Brink et al. 2020) and use it to extend the 5Rs of openness. We build on the ideal of the parity of participation, deeply rooted in "equal autonomy and moral worth of human beings," which in itself is deontological and non-sectarian, demanding that all members of a society/community should be able to participate as peers in interactions and activities related to that society/community (Fraser & Honneth, 2003, p. 229). In this way, both Wiley's 5Rs (2014) and Fraser's 3Rs provide a theoretical foundation to scrutinize *EdTechnica* as an artifact of openness (OER) and an example of practice (OEP) in terms of accessibility, flexibility, justice, and sustainable generosity. However, care must be exercised as we apply these principles in developing and implementing OER/P in various contexts because misunderstandings and misrepresentations could contribute to further injustices and inequalities (Veletsianos, 2021). For example, [smaller] economies that are still developing digitally often inherit misrepresented views. Perceptions framed based on inadequate acknowledgment of contextual factors may lead to misaligned solutions and contribute to existing and shared knowledge later referenced in publications. The catalyzing effect of academic rhetoric means that the knowledge currency of the field (i.e. articles, books, encyclopedias, etc.) continuously perpetuates such faulty perceptions and theories, which unfortunately further filter into our pedagogical, administrative, and research practices. Engaging in an approach that clarifies and embraces origins and recognizes contextual differences presents a path for a different yet clearer way forward.

Our discussion of OER artifacts and open educational practices related to *EdTechnica*, its development, governance, and publishing activities are organized into four categories: accessibility, flexibility, justice, and sustainable generosity. In the following sections, we will delve into each of the four principles and illustrate how they are embodied in *EdTechnica* and its governing board practices to provide a glimpse into what the future of education could look like. Throughout our discussion, we aim to describe the artifacts and practices and, in some instances, reveal our intents, rationale, and contextual background to help the reader appreciate our intentionality and deliberate choices, illustrate what these concepts might look like in application, and further reflect on the

relationships among these ideas. The evidence for our claims comes from five primary sources: (1) *EdTechnica* as an OER and an artifact of our practice, (2) governing board meetings and minutes, (3) feedback from current and prospective authors, (4) observations from other publication processes, and (5) reflective commentaries of the governing board members during a 2023 panel discussion of the Association for Educational Communications and Technology (AECT) annual convention (Allman et al., 2023). We recognize that our statements, conclusions, and recommendations are specific to our circumstances while hoping others may extend these ideas and applications to their own contexts in ways that best match their circumstances and projects.

Accessibility

First, *EdTechnica* embraces a future where all content is accessible to all—learners included. This accessibility takes various forms and is enacted through various practices, some common to other OERs and others unique to the encyclopedia. When we claim that *EdTechnica* is accessible, we mean this in at least four ways: economically, legally, technically, and communicatively. Notably, all of these considerations reflect an approach to academic publishing that embraces universal design for learning (UDL), in which *EdTechnica* seeks to make knowledge as accessible and useful to as many people as possible by designing for the most diverse use cases imaginable.

Economic accessibility

Publishing is an important currency in academia, and access to current knowledge is often tightly controlled by gatekeepers who gain commercial benefits by limiting access. Current publishing structures take advantage of this fact and monetize and colonize the academic publishing system in ways not conducive to the public good (Duke University Libraries, 2017). This situation becomes even more bizarre when the author of an article wants to access their own work as an independent researcher and must pay to access or reuse it. For many throughout the world, commercial access to a single article might be equivalent to a month's salary or more. Such commercial abuses of knowledge sources encourage unethical behaviors, such as so-called "piracy" of content. In many countries, downloading pirated scholarly work is seen as both tolerable and even morally justifiable (e.g. Sci-Hub, Library Genesis) as many scholars work against commercial publishers to make knowledge illegally available to their learners and are held up as heroes in a type of shadow war against the economic gatekeepers of knowledge (Dulong de Rosnay, 2021; Elbakyan & Bozkurt, 2021).

EdTechnica contrasts these broken systems that encourage illegal and unethical behaviors because all articles, supplements, and content formats are provided freely on the internet, including the ability to download the full encyclopedia or individual articles in multiple formats. There are no paywalls or logins of any kind needed to access content. There are also no processing or publication fees, thereby extending free access to anyone who wants to participate in any way, including students, informal readers, faculty authors, instructors, researchers, reviewers, and so forth. The basic format of all articles is simple HTML, which allows for low-bandwidth access to resources from locations throughout the world where broadband might be limited, or downloads may be metered or expensive, and being hosted on a cloud server allows for improved uptime

and network access for worldwide access. This means that anyone, anywhere, can access or create content without dealing with login mechanisms, paywalls, bandwidth limitations, server uptime, or moral dilemmas that pit the acquisition of wealth against the public good. In the past year, content in the encyclopedia has been accessed more than 50,000 times, with more than 12,000 PDF downloads and more than 2,000 MS Word downloads. More than half of these users are from outside the U.S. and roughly one-in-four access the content on their mobile devices (see Fig. 1), thus increasing economic accessibility via the freedom of cost.

Legal accessibility

All entries in the encyclopedia are also licensed under the Creative Commons Attribution 4.0 (CC BY) license, which is the most permissive of the CC licenses. This license enables reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator (Creative Commons, n.d.). Though many OER projects use more restrictive CC licenses, such as the share-alike or non-commercial derivations, we rely on the CC BY license to allow for the most freedom possible and to prevent confusion when individuals might want to use articles in unforeseen settings, such as for-profit universities, private schools, corporate training departments, or countries with diverse copyright requirements. As stated in the author guide: "The encyclopedia only uses the base CC BY license and does not add additional stipulations on use (e.g. non-commercial, share-alike, no-derivatives). This is intended to allow for the greatest possible use of encyclopedia articles in the field" (EdTechnica, 2022). This stance is a manifestation of an underlying belief that knowledge is a universal human good and should not be needlessly restricted by individuals and organizations in advancing our global society. Embracing openness in this way makes scholarship and knowledge more democratic and transparent. It encourages infinite sharing by simplifying legal requirements to their most basic form (i.e. attribution) via open licensing.

Technical accessibility

Though all OER are legally accessible, many are not technically accessible, negating basic usability. Consider, for instance, any work in a community library that passes into the public domain but is not scanned or shared online. Though that work is legally accessible to anyone, it will not actually be accessed. Similarly, many OER are merely shared as PDFs, image scans, or other formats that make technically enacting the 5Rs difficult

Fig. 1 Encyclopedia traffic demographics

or impossible, such as changing the text on a scanned image. In contrast, *EdTechnica* focuses not just on making content open in a legal sense but also in a practical sense that is usable, available, and infinitely remixable. We do this in three key ways.

First, all content is primarily provided in a simple web (HTML/CSS) format that is designed to be mobile-first, which means that it is optimized for viewing on mobile devices but then scales up to larger screens if available (see Fig. 2). Most users of the EdTech Books platform, upon which *EdTechnica* is hosted, live outside the U.S. and most of those users access content on mobile devices, meaning that providing the content in a traditional web format would be disenfranchising for such users. On the author's end, we accept submissions in Google Doc formats to prevent contributors from needing to learn a new system just to participate and then translate their submissions into mobile-friendly HTML. In regions where access to Google Suite tools is restricted (Frankiewicz, 2023), we encourage authors to submit entries using text editing tools that are available to them. Despite the importance of such considerations, very few open publishing projects actually do this.

Second, all content is provided in various formats at two levels of granularity: the overall encyclopedia level and the individual article level. Readers can access content online, download as PDFs or Word documents, copy the HTML source code, listen to lifelike text-to-speech renditions of the textual content, embed articles in LMS or website iframes, print simplified outputs without background images or other web elements, or access encoded versions of the content via the open API. This permits users to edit, copy, and remix the content in various ways without having to seek permission, request special formats, or purchase expensive software (such as Acrobat Pro). It also means that content can be directly imported and remixed into new projects, such as progressive web apps and API-enabled mobile apps, or stored and shared in offline or limited access scenarios, such as in classrooms with limited or spotty internet access. If building their own books or course readers in EdTech Books, users can also simply press the copy button and make their own editable copies of articles with the appropriate citations being carried over automatically for them.

Third, all content is indexed, keyworded, and tagged with metadata to allow for search engine optimization (SEO) and easy finding of resources. This ensures that if someone is looking for information about "cognitive load theory" on Google, they will be directed to the article rather than its encompassing book or another site reference. On this note, abstracts are also written in a manner to ensure SEO by allowing Google and other

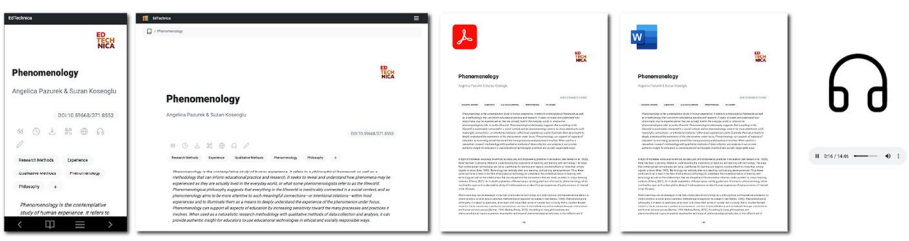


Fig. 2 Example formats of an EdTechnica article

search engines to easily recognize the simple definition of the term for display in their own abstracts and synopses.

Communicative accessibility

Building from this same idea, the language used in academic publishing can also limit its accessibility both to learners at various stages of knowledge development and to a worldwide audience that exhibits a variety of native languages, cultures, and ways of being. As such, good examples of OER and OEP should consider the language and other communicative needs of their intended audiences and make content appropriate for their goals. *EdTechnica*, therefore, seeks to provide all articles in a manner that is content-rich but plain in language and in an easy-to-understand manner so that complex ideas and topics can be easily understood by everyone. We do this by limiting article length to 1,000 words, requiring abstracts to be clear and straightforward, providing Flesch-Kincaid readability scores (Flesch Reading Ease, n.d.) and predictive data on reading time to authors, and coaching authors in adjusting language to a worldwide audience, such as by defining terms, removing jargon, and providing examples and illustrations when helpful. In addition, we are currently exploring using generative AI to build automated summaries, keyword tagging, and other supports for articles that can assist in making them more easily digested.

Flexibility

Building off of technical accessibility and its importance in universal design for learning (Delisio & Bukaty, 2019), *EdTechnica* also adopts an editorial and publishing model that ensures flexibility or agility in its products and approaches. Such flexibility is particularly important because of the rapid pace of change and diverse contextual needs in both technology and education, and the theories and principles of the field represented in the encyclopedia should allow for and adapt to such change (Brewer et al. 2006; Cope & Kalazanthis, 2000). Some ways in which flexibility is manifest in *EdTechnica* include flexibility in (a) content, (b) media, (c) modularity, and (d) ecology.

Content flexibility

In traditional publishing models, content is treated as static and unchanging, with corrections only coming in the form of later addenda or retractions and improvements coming in the form of sporadic and delayed edition releases. With *EdTechnica*, however, we expect authors to work with editors and the community to continually correct errors and update content as new discussions and findings occur, striving for continuous improvement. By making the platform easy to edit and revise, micro-edits (such as grammatical fixes and incremental improvements) can be made by original authors to ensure accuracy and relevancy. Beyond this, however, we also accept macro-edits from other authors as considerations for revision, which, if accepted after peer review, expands the author list of the article to include ongoing contributors. For example, if there is a significant development in a topic, then the original author or another author can provide an update to the article, which will then go through another round of peer review. Through this process, our goal is to have past versions of each article available

for historic auditing but to allow the article to evolve as needed to ensure continuous improvement and increasing value. In addition, all articles include quality assurance surveys so that readers can weigh in on the current status of the article and also provide suggestions for improvement. By aggregating article performance in relation to others, editors can then prioritize which articles are in the greatest need of attention, revision, and improvement.

Media flexibility

In addition to the common textual format of encyclopedia articles, we strive for multimodal design, implementation, and use. We encourage authors to include hyperlinks, insert videos, and embed other multimedia artifacts or learning aids into their articles. We extend this invitation to the community and invite anyone to submit links to additional community resources that may be listed on encyclopedia pages that may be useful. With this flexibility, we also collect analytics data on usage, such as how often an audio version of each article is listened to and how long readers watch videos to help us recognize which articles and formats are performing well and are helpful to the community, and alternatively, which ones could use improvement. This approach encourages a much more dynamic environment than a traditional encyclopedia or journal publication by making each article more of a hub of resources that is expected to evolve, update, and improve over time rather than a simple, static text resource—multimodal in design, implementation and use.

Modular flexibility

When traditional publishing approaches and even OER provide resources in an omnibus fashion, such as by a single aggregate file for an entire book or course, they drastically limit others' engagement in the 5Rs. For instance, in some LMSs a full-book PDF cannot be readily embedded to give students access to the reading for a given week, and most ebooks do not allow direct linking to specific content within the book. The result is that referencing materials is indirect and introduces additional extraneous cognitive load for learners in the form of unnecessary clicks (e.g. finding the desired chapter in a list) and unnecessary content (e.g. ignoring the introductory materials to jump to the desired area). In contrast, *EdTechnica* provides all content in a highly modularized manner, aiming towards remixability and reusability, wherein each article can be directly referenced, embedded, copied, and remixed via a link or QR code. Furthermore, each heading of each article may be referenced and embedded via a direct link to allow for more focused learning experiences (see Fig. 3). As such, anyone who uses *EdTechnica* needs only attend to the parts of the content that are directly relevant to them and their needs while ignoring parts that are not.

Ecological flexibility

And finally, the nature of the modalities and technologies used for hosting *EdTechnica* allow it to be responsibly and reliably scaled as a means to improve environmental sustainability. Though content can be printed on demand, the vast majority of readers utilize the web interface, and the mobile-first design allows content to be accessed on low-power devices. This prevents the ecological impacts of unnecessary printing and

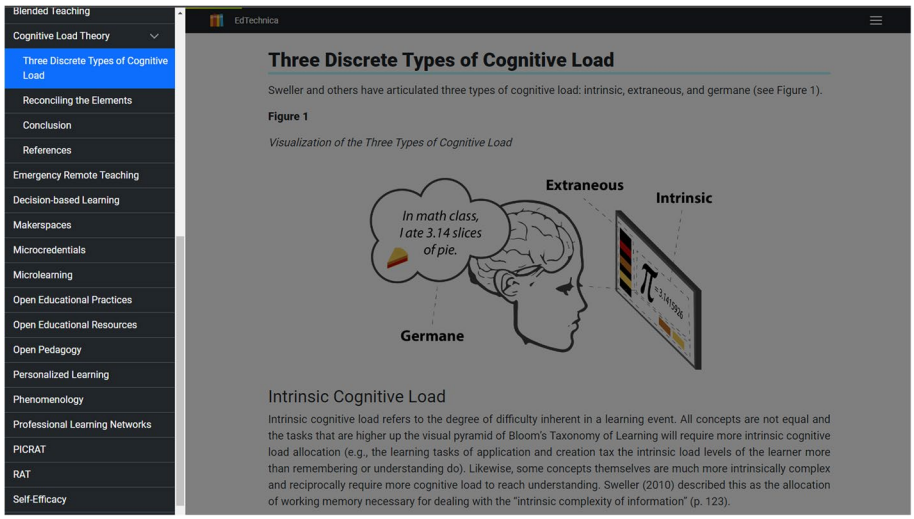


Fig. 3 Example of a direct link to a content heading for embedding purposes

provides information access at the lowest possible cost. In addition, more advanced features that require greater power consumption, such as generative AI summaries, automated translations, and audio conversions, are cached on the server to prevent their need to be subsequently rebuilt for each user. This same model is followed for the articles themselves when retrieving textual data from the database and reduces power consumption on server hardware by 90% or more. All of these technological decisions allow the encyclopedia to be run on a shared cloud server for a current cost of about $1–2 per month, inclusive of data transfer and media processing fees. This allows us to make the information available to the world without needing to rely upon subscription fees, advertising, or other business models that would limit growth while also maintaining a minimal power consumption footprint.

Justice

As education becomes more accessible and flexible, we would expect our artifacts and processes to become more diverse and representative of the world. Yet, ongoing scholarly work in this area suggests that the central tenets of openness may not be fully equipped to directly address inherent goals of equality, equity, justice, democratization, or liberation (Veletsianos, 2021; Veletsianos & Kimmons, 2012). In fact, as Veletsianos (2021) points out: "If we are not mindful, the creation and use of OER could not only reflect inequities but reinforce them as well" (para. 7). Somewhat paralleling the 5Rs of openness, Nancy Fraser articulated 3Rs of justice, arguing that "justice [is] a three-dimensional problem, in which redistribution, recognition, and representation must be integrated in a balanced way" (Fraser, 2005, p. 305). In an economic and social sense, these 3Rs suggest that a just society (a) redistributes resources to care for all, (b) recognizes the contributions of all, and (c) represents the values, cultures, and identities of all. Applying these principles to OER/P, the 5Rs of openness seem to align well with the first R of justice by redistributing resources to all at a systematic/macro level in an accessible and flexible manner, as discussed in the above sections. However, recognition and

representation require additional attention, such as by appropriately valuing and giving credit to those who contribute and ensuring that knowledge artifacts represent all rather than simply those in power or those who have the capital necessary to fully participate in OER creation (e.g. white, male professors in North America who have the time and money to create open textbooks). In so doing, diversity in OER/P becomes an important indicator of justice as its presence reveals the incorporation of restorative practices, and its absence reveals business-as-usual approaches to education (Hodgkison-Williams & Trotter, 2018). To address this, the governing board of *EdTechnica* has also intentionally sought to promote justice as recognition and representation in several key ways.

Recognitive justice

One of the greatest barriers to OER creation and adoption continues to be perceptions of OER as being lower quality than traditional publishing artifacts and the fact that OEP are not generally valued by educational institutions for tenure and promotion (Kimmons, 2015; Kimmons & Irvine, 2023; Martin & Kimmons, 2020). Couple this reality with the fact that faculty who are intersectionalised (e.g. women or those who represent minoritized religious, cultural, or ethnic groups) may have higher demands for mentoring and citizenship than their paternalistic counterparts (Misra et al. 2021), and it becomes clear that to justify participation in the creation of OER, contributors should receive adequate recognition for their efforts. Additionally, the work that they produce should be combined with support services necessary to give it at least the same production quality as traditional commercial counterparts.

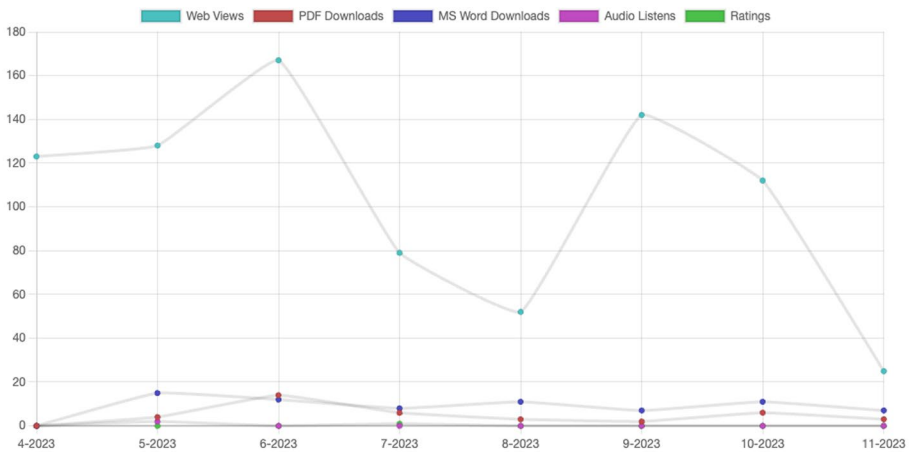
The politics of recognition aims to establish status equality rather than mere validation of a group's identity and demands adjustments to enable all individuals to participate as full partners in social interactions and activities (Fraser et al. 2004). To this end, *EdTechnica* provides several technical and expert supports for authors to ensure that their work will receive the recognition it is due and help them engage more fully in academic activities. For many, recognition is the knowledge currency that creates an immediate and unchallenged trust of the effort and contribution to the field. In our practice, we strive for recognitive justice through improving visibility and discoverability, promoting academic reputation, and assisting in academic publishing activities with the goal of inviting authors' engagement and further legitimizing their efforts.

Technical supports that improve visibility and discoverability include assigning digital object identifiers (DOIs) to each article, providing proper metadata for accurate indexing, and ensuring search engine optimization. Assigning DOIs uniquely identifies an article or document, providing it with a precise location on the web and making it permanently discoverable. Using DOIs for *EdTechnica* entries helps readers easily locate individual articles from a citation and prevents problems if the web address/URL associated with the publication changes. As a globally established publication standard, DOI associated with a publication also adds perceived legitimate value and credibility as a digital scholarly resource. *EdTechnica* entries are also provided with proper metadata for accurate indexing of articles in Google Scholar and other services. Indexing engines continuously crawl the web, looking for scholarly publications using the article's metadata and metatags, collecting information such as title, author, and publication date. *EdTechnica* editors help increase the visibility and discoverability of its entries by following a set

of guidelines and recommendations that minimize indexing errors. Similarly, measures are taken to ensure search engine optimization and high search engine result placement to make entries more visible and discoverable.

Assistance is also given to authors to establish and promote their academic status and dissemination of their work. *EdTechnica* authors are encouraged to provide and keep up-to-date a biography that is available across all works on the EdTech Books platform. Hyperlinks to authors' other works on the platform are automatically included in the expanded biography view, and the author can update links to CVs, social media, institutions, Google Scholar, ResearchGate, LinkedIn, and other tools for networking as desired. To further promote dissemination, easy citation, and remixing, each *EdTechnica* entry includes a suggested citation, embed codes, QR codes, and API endpoints.

Finally, authors are offered expert support throughout the publishing process to promote their engagement in academic publishing activities and further legitimize their efforts. Besides providing an Author Guide and a writing template, *EdTechnica* authors are offered graphic design and copyediting support to improve formatting and visual aids. Authors are encouraged to submit high-quality entries with an expectation that their work will be peer-reviewed, which is another mechanism to promote recognitive justice. Peer reviews confer a level of legitimacy by ensuring credibility and verifying the quality of an academic piece. All *EdTechnica* entries are carefully reviewed by scholars with high levels of expertise in the field to ensure the quality and originality of the content. Editors invite experienced peer reviewers for each entry, provide clear evaluation guidelines, and walk peer reviewers and authors through a series of steps to ensure the final entry meets the expected standard. When an entry is published, authors are also given access to advanced, detailed analytics information via an article usage dashboard (see Fig. 4).



Indicator	Value
Rating (avg)	3.7
Rating (total)	7
PDF Downloads	291
MS Word Downloads	74
Page Views	2,172

Fig. 4 Example of part of an article's analytics dashboard

This last support is especially important for providing recognition as it gives authors the ability to show the perceived quality and impact of their work for tenure and promotion purposes in a manner that is much more robust than simple citation counts or journal Impact Factor. These analytics also include many advanced data points far beyond what commercial publishers and other open publishing platforms provide, such as cost savings calculations, predicted reads, embedded video-watching behaviors, and more. Taken together, these supports help to ensure that the work done by scholars to create the encyclopedia is recognized as being of high quality and providing a high impact on the world.

Representational justice

Representation is another important factor of social justice, closely related to redistribution, and recognition. It allows us to examine governance structures, decision-making procedures, and who participates in and guides the discourse (Fraser et al. 2004)—addressing the policies that allow us to be governed and exist in this field. In the current OER publishing landscape, there exists an imbalance between creators and readers, wherein those who create OER tend to be from more affluent countries and have more social capital than those who use them. Thus, advantages to some, such as native fluency in English or advanced training in academic writing, may become a barrier to participation for others, leaving them on the periphery of the activity. This has a marginalizing effect on the vast majority of potential authors throughout the world who are doing valuable work in this specific field, leaving out their voices and perspectives. To address this issue, the *EdTechnica* governing board purposefully engages in various activities and has adopted a number of policies to ensure that the encyclopedia represents diverse perspectives in the field. These include representation through diverse leadership, ensuring diverse authorship, supporting linguistic diversity, and providing nurturing editorial support.

EdTechnica's governing board and its editor-in-chief are "researchers and practitioners who have agreed to provide editing, leadership, and strategic support to the encyclopedia" (EdTechnica, 2022, Organizational Structure). Each governing board member was nominated and elected through a transparent and democratic process by the review board to serve for fixed terms. They represent men and women with various expertise and backgrounds from institutions across the world, ensuring representation through diverse leadership. Similarly, we strive to ensure wide representation through diverse authorship. Although anyone, including students, K-12 professionals, and practitioners, is invited to submit entries, *EdTechnica*'s governing board is intentionally inviting historically marginalized individuals to submit articles, to ensure that women, practitioners, and non-US authors are represented. Additionally, valuing collaborative knowledge creation and seeing it at the heart of open educational practices (Bali et al. 2020), we encourage all articles to be jointly authored by individuals representing at least two institutions. This vision has been enacted in three ways. First, initial contributions to *EdTechnica* were solicited specifically from individuals who historically have had less of a voice in academic disciplines. Second, after these initial contributions were solicited, the governing board worked to develop processes that would enable anyone to easily submit a manuscript and this process was carefully outlined in the beginning of the book. Finally,

at several international conferences, board members have presented on *EdTechnica* and extended invitations for contributions, emphasizing that editorial support is available to all interested in contributing. These three methods have enabled the board to invite, facilitate, and support submissions from diverse members of a specialized academic field.

We also strive to support linguistic diversity to adopt a wider view beyond Western-centric and English language dominance in OEP and encourage active participation globally (Bossu & Ellis, 2023). Currently, we provide translation services for articles into various languages using Amazon Translate and then permit authors to manage translators in fine-tuning those translations. Translations in many languages can then also be processed into lifelike text-to-speech audio to better support learning and multimodal access in those languages. Aspirationally, we are also seeking to further innovate in this area in a few key ways. We have a goal to eventually move to a no-source-language model for the encyclopedia in which, rather than only accepting English-language submissions that are later translated into other languages, we accept submissions in any language and then oversee review in those languages, providing the final product in both the native language and in a translated English version. We aspire to this because we believe it will help to more fully empower native speakers of other languages to contribute their knowledge to the encyclopedia and challenge the Anglo-centric standard of most OER and education scholarship.

Finally, we encourage representation by involving all who want to participate, including students and professionals, in the peer review and editorial process (e.g. as associate editors) and by adopting a nurturing editorial approach to peer review. In most editorial scenarios, such as academic journals, editors interpret their roles solely as gatekeepers of the publication—only allowing content to make its way into the final publication after it has undergone rigorous peer review and editorial oversight. With *EdTechnica*, editors serve this important gatekeeping role by managing peer reviews of articles and overseeing copyediting, but we also encourage authors to resubmit following negative reviews and give them guidance on how to make their contributions meet the standards we expect. In some cases, this might even include editors stepping in to assist authors in actual rewrites and taking on the role of secondary authorship to help move the work across the finishing line. This nurturing approach to editorship eschews low acceptance rates as an indicator of rigor but rather views editors as servants to the profession who guide prospective authors in creating quality work. Such an approach is especially important in mentoring new or disenfranchised authors, such as those outside the U.S. those without a terminal degree, those in non-professorial settings, those for whom English is not their primary language, and students, and is driven by the belief that more voices are better than fewer and that all who want to participate in the academic conversation should be given the encouragement and guidance to do so.

Sustainable generosity

And finally, none of these efforts would achieve their aims unless they were couched within socioeconomic systems that allowed for their growth and future existence in a sustainable manner. Elsewhere, the second author has proposed the notion of "sustainable generosity" as a motivating principle (Kimmons & Irvine, 2023) for developing

"generous systems." Similar to Bryan Stevenson's (2021) principle of proximity as being a precursor to justice, a generous system is one that operates out of caring concern for the other and makes generous impulses proximate to the needs of the other by connecting generosity to need. Operating within the larger project of EdTech Books, *EdTechnica* operates on the beliefs and values of building generous systems by empowering those with time, talents, expertise, and resources to share those with others in need—via the creation and sharing of high-quality learning materials—and by removing barriers to generosity that prevent those who otherwise would share from doing so.

The funding mechanism behind EdTech Books and *EdTechnica* relies upon faculty donating their time and using university resources to fund technology infrastructure, support, and student wages. Through strategic development efforts, ongoing funding needed to keep these systems afloat is very minimal. For instance, the entire EdTech Books platform runs on cutting-edge Amazon Web Services cloud servers and provides content to over 120,000 people every month while costing less than $100 per month; this means the technical upkeep of *EdTechnica* is likely less than $1 per month. Student wages are also leveraged as available to assist volunteer faculty with graduate students serving as associate editors, and though non-essential to the functioning of the encyclopedia, this funding alleviates demands on volunteers and gives graduate students valuable editorial experience while being paid.

The bulk of the actual cost of any scholarly project rests on faculty wages, but since faculty at many universities throughout the world are already donating their time for editorial work to commercial publishers, it seems reasonable to enable routes to such volunteer work that actually promote justice and equity via more open practices (i.e. connecting generosity to need rather than generosity to greed). That being said, a generous system should honor and protect the generosity of faculty who are donating their time and should provide them as much benefit as possible for doing so, thereby allowing them to be generous with the system rather than in spite of it (as would be the case with commercial models). For this reason, our efforts with EdTech Books and *EdTechnica* also seek to benefit faculty volunteers in a variety of ways, such as by indexing their work in Google Scholar, encouraging citations, increasing the impact of scholarly efforts via search engine optimization and findability, and drawing attention to faculty work via profiles, external accounts, etc. Considered in concert with one another, we envision a future of educational technology through these efforts that value generosity, empower participation, and democratize access by altogether removing historical barriers related to cost and access that heretofore have dictated whose voices are heard and who has access to learning.

Stepping into the future—hopeful always

EdTechnica is a resource and practice carefully designed to be accessible, flexible, and just drawing upon the sustainable generosity principle. However, this example is not meant to be a one-size-fits-all solution; contextual elements have also contributed to the success of the model. Any project aimed to enact the principles described here needs to be customized to the context of the specific project, and the details of how the principles are enacted will vary depending on that context. In looking forward to the future, we

believe that the structural foundation and model provided by *EdTechnica* can be built upon and followed to address several persistent problems in education and to provide a future that is more just and more hopeful. Some key examples include:

- Removing socioeconomic, geographic, and language barriers to creating, disseminating, consuming, and applying knowledge;
- Providing publishing and information access approaches that are more sustainable and environmentally responsible;
- Promoting inclusive and egalitarian access to high-quality open educational resources;
- Encouraging global stakeholder cooperation to reduce OER development investment duplication and create a worldwide pool of culturally diverse, regionally relevant, gender-sensitive, and accessible educational materials in different languages and formats;
- Improving alignment between who is doing the work of educational technology throughout the world and who is cataloging and creating scholarly knowledge;
- Reducing distance between educational programs and work being done in the field;
- Legitimizing OER as high-quality educational materials and OEP and OER creation as legitimate scholarly activities wherein contributors are recognized, valued, and sustained;
- Improving the richness, quality, up-to-dateness, and usability of learning materials;
- Improving the ease and quality of course design;
- Improving scholarly processes to be more nurturing and supportive of scholars' well-being;
- Utilizing generative AI in refining educational resources and providing multilingual access;
- Providing models of AI use that are responsible, ethical, and empowering toward humans—a co-partnering of and with tools; and
- Empowering generosity, democratization, equity, and justice.

EdTechnica is both an OER and an artifact of an OEP. By striving to align the scholarly community of technology with principles of openness, we can expand our potential for impacting education on a global scale. Rather than lamenting dystopian visions of the horrors of technology's influences on education or blindly embracing techno-optimistic pipe dreams of educational futures, we believe the vision offered by this model is virtuous, tenable, hopeful, and ambitious. The optimism and hope we feel with such a model rests not in the cold technologies and algorithms that surround the educational technology field but in the warm goodness of all who engage in the field of educational technology—their hearts and associations with one another—as they seek to use their time, skills, talents, and tools to make the world a better place.

Abbreviations

DOIs	Digital object identifiers
OEP	Open educational practices
OER	Open educational resources
OER/P	Open educational resources/practices

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