

# Open scholarship and bibliodiversity

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## Abstract

This paper is based on the Open Scholarship and Bibliodiversity panel presented at the 2024 NISO Plus conference in Baltimore, Maryland on February 13, 2024, and brings together five perspectives on the interdependency of open scholarship and bibliodiversity. Bibliodiversity in the context of open scholarship refers to the diversity of publishing models, platforms, and formats that are available for scholarly communication. It emphasizes the importance of a varied and inclusive ecosystem for acquiring academic knowledge and for the dissemination of research. An important part of bibliodiversity is the inclusion and the promotion of a diversity of scholarly voices. The authors explore how to ensure that a scholarly infrastructure includes a multitude of voices, is accessible to everyone, and can be expressed in a variety of ways.

## Keywords

Open science, open access, bibliodiversity, persistent identifiers, inclusive metadata, African research, scholarly communication infrastructure, independent researchers, refugee scientists, scholarly voices

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## Introduction

### *Bibliodiversity and open scholarship*

First coined by Chilean publishers in the late 1990s, the term “bibliodiversity” was originally defined as “cultural diversity applied to the world of books<sup>1</sup>” and encompassed the “critical diversity of products (books, scripts, eBooks, apps and oral literature) made available to readers.<sup>1</sup>” Bibliodiversity in the context of scholarly communication is referred to by Shearer et al.<sup>2</sup> as “Diversity in services and platforms, funding mechanisms, and evaluation measures [that] will allow the scholarly communication system to accommodate the different workflows, languages, publication outputs, and research topics that support the needs and epistemic pluralism of different research communities.” As argued by Shearer et al.,<sup>2</sup> the transition to open access and open science presents opportunities to foster greater bibliodiversity. Following the principles of the Jussieu Call for Open Science and Bibliodiversity,<sup>3</sup> open access must be intentionally complemented by bibliodiversity and not restricted to a single approach. Bibliodiversity is an essential hallmark of an open and equitable scholarly communication ecosystem that in its systems and structures includes and promotes a diversity of scholarly voices.

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## *Perspectives on the promotion of a diversity of scholarly voices*

This paper presents five perspectives on bibliodiversity from authors representing researchers, institutions, and projects focused on open scholarship. How do we individually and collectively promote a diversity of scholarly voices with the choices we make in supporting open scholarship? And how do we ensure that scholarly communication includes a multitude of voices, is accessible to everyone, and can be expressed in a variety of ways? In support of multilingualism—a vital component of bibliodiversity in scholarly communication<sup>4</sup>—two authors with a mother tongue or first language other than English share perspectives in their native language and in English. Nokuthula Mchunu, Deputy Director at the African Open Science Platform (AOSP), discusses open science as a means to achieve bibliodiversity and shares the work of the AOSP<sup>5</sup> hosted by the National Research Foundation of South Africa in IsiZulu and English. Maureen Walsh, Scholarly Sharing Strategist for The Ohio State University Libraries (University Libraries) highlights a large North American research library's investments in open scholarship toward bibliodiversity and discusses the potential for open access investments to lead to unintended barriers for diverse scholarly voices. Nataliia Kaliuzhna, Research Associate at TIB—Leibniz Information Centre for Science and Technology, and PhD student at Kyiv National University of Culture and Arts, identifies hurdles to open access publishing for researchers with weak institutional ties and provides an overview of the newly launched IDAHO project<sup>6</sup> in Ukrainian and English. Mohamad Mostafa, Regional Engagement Specialist, Middle East and Asia at DataCite discusses his work building a trusted and equitable open research infrastructure using persistent identifiers (PIDs), including support for universities, institutions, and emerging research communities across Asia and the Middle East and North Africa region. Katherine Witzig, a metadata expert from the Oklahoma City University and a student at the University of Illinois Urbana-Champaign, discusses her work as co-chair of the Program for Cooperative Cataloging (PCC)'s Task Group for Metadata Related to Indigenous Peoples of the Americas.

## **Open science to achieve bibliodiversity**

### *Open science*

The UNESCO Open Science Recommendation, formally adopted by UNESCO's one hundred and ninety-three Member States in November 2021, gave critically important official support for open science.<sup>7,8</sup> The UNESCO Recommendation is a global framework for open science policy that is inclusive in language, other knowledge systems, and society in achieving unification in the process of creating knowledge and access. It provides a more comprehensive understanding of the meaning of open science, to include various movements, aiming to make multilingual scientific knowledge openly available, accessible, and reusable for everyone for the benefit of society. This includes methodologies and protocols, infrastructure, software, code, or any activities in the pathway of knowledge production, with the overarching principle of equity. Openness and sharing of information are fundamental to the progress of science and to the effective functioning of the research enterprise.<sup>7</sup>

Language is one of the critical factors that can determine the level of participation for anyone, be it scholarly, governmental, or public.<sup>9</sup> It has been shown that sharing or consuming information in a language that is your mother tongue or that you regularly use, promotes better learning and information retention.<sup>10</sup> Due to the history of colonization, many African scholars predominantly use European languages rather than their mother tongue for their scholarship. Studies show the over dominance of the English language in scholarly outputs with many non-native English contributions rejected due to "poor language use."<sup>11</sup> English-only publishing can make communication easier and less complicated for journals, but it limits the number of people who can engage with the information which is contrary to the intended purpose of disseminating scholarship.

Open science is aimed at overcoming barriers and increasing inclusion and diversity as a norm in the research process. The following section will provide a short discussion on the effort of the AOSP in the collective endeavor of providing a diverse and equitable scholarly output platform for African scholars aimed at promoting discoverability of these outputs.

### *A vision for an open Africa: The African Open Science Platform*

The African Open Science Platform (AOSP), envisioned as a pan-African endeavor, aims to position African scientists at the cutting edge of data-intensive science. By creating an advocacy and diplomacy platform to stimulate interactivity, opportunities are created through scale to amplify impact through a commonality of purpose and voice.

The AOSP was first conceptualized during the 2015 Science Forum. It was organized by the Inter Academy Partnership (IAP), The World Academy of Sciences (TWAS), the International Council for Science (ICSU), and the International Social Science Council (ISSC). This first Science International meeting led to the publication of an

international accord on open data.<sup>12</sup> During that 2015 meeting, the suggestion to initiate a pan-African platform on open science was supported, with an announcement of the AOSP during the 2016 Science Forum. The platform was presented by Dr. Khotso Mokhele, co-chairperson of the advisory council of the AOSP and former President of the National Research Foundation (NRF), and acknowledged by the Minister of Science and Technology, South Africa (DST), Minister Kubayi-Ngubane.<sup>5</sup>

Following the end of a pilot phase in 2018, the AOSP embarked on the establishing, promoting, supporting, and scaling of open science activities in the continent with one of the main focuses being equitable forms of scholarly outputs. With the vastness of the African continent, regional priorities on open science may differ. Therefore, it was crucial to establish regional nodes that would work with the stakeholders within their regions and with other regional nodes. Currently three regional nodes have been appointed: (1) Egyptian National Authority for Remote Sensing and Space Sciences (NARSS) for Northern African Node based in Egypt, (2) African Institute for Capacity Development (AICAD), East African Node based in Kenya, and (3) UbuntuNet Alliance for Southern Africa Node based in Malawi.

UbuntuNet Alliance (Southern Africa Node) worked in partnership with the AfricArXiv initiative<sup>13</sup> to reposition this repository as a platform to archive and disseminate the outputs created from all research conducted in the continent. The platform aims to at least translate all deposited abstracts in the many different languages of the African continent. The collections will provide visibility and ensure that the research outputs are appropriately archived and discoverable by others for use in research and teaching and safeguarded for the long term. To accomplish this, a space within AfricArXiv, a locally hosted repository (UbuntuNet Open Science Cloud), will host collections of output from differently funded projects ensuring that they are accessible to the researchers, funders, and institutions. The overall objectives of the initiative are to:

- Provide the infrastructure for archiving research outputs by creating a customized collection on the UbuntuNet Alliance's repository, AfricArXiv.
- Train researchers on the importance of having the appropriate metadata associated with their research output to ensure easy discoverability.

### *Umbono we Africa evulekile: I-African Open Science Platform (A vision for an open Africa: The African Open Science Platform repeated in the IsiZulu language)*

I-African Open Science Platform (AOSP) inombono wokuba inqalasisizinda solwazi ulukhiqizwa ucwaningo lwezesayensi e-Afrika ukuze lenze bonke ososayensi—afrika benze ucwaningo olusezingeni elephezule besebenzisa izindlela ezintsha zokucwaninga, ulwazi kwezekhomputha nokwabelana ngolwazi, ukuququzela, nokusebenzisana nokwenza amathuba amaningi okukhulisa ulwazi namakhono ukuze kususakale umphakathi wonkana.

Lengqalasisizinda kwaqala ukucatshangwa ngayo ngonyaka ka-2015 kwi-Science Forum, lapho kwakuhlangene khona i-Inter Academy Partnership (IAP), The World Academy of Sciences (TWAS), International Council for Science (ICSU) ne International Social Science Council (ISSC). ICSU ne ISSC yahlanga ngo-2018 kwaba yi-International Science Council, lapho kwaphuma isivimelwano somhlaba ngokusetshenziswa kwe-data evulekile.<sup>12</sup> Kwakukulowo mhlagano lapho kwaphakanyiswa ukusungulwa kwe-African Open Science Platform okwathola ukusekelewa kwaphumela esimemezeleni ngo-2016 kwi-South Africa Science Forum yangalawonyaka. I- Platform yethulwa u- Dr Khotso Mokhele, owayengusihlalo se-Bodi se-Platform futhi eholi i-National Research Foundation (NRF), kanye noNgqongqoshe wezesayensi nocwaningo, South Africa (DST), uNgqongqoshe Kubayi-Ngubane.<sup>5</sup>

Kusukela ekuphothulweni kwe-pilot ngo-2018, i- platform iye yaqhubeka ikhulisa imizamo yayo ekusunguleni nasekusekeleni imisebenzi nemicibi yoCwaningo Oluvulelekile yezwekazi lase Afrika ikakhulukazi emkhakheni wokusatshalaliswa kolwazi kubancwaningi. Njengoba sazi ukuthi izwekazi lase Afrika likhulu futhi ezindawo ngezindawo zinezindingo ezahlukene kubalulekile ukusungula amagatsha e-AOSP azizobhekana nalezozindingo. Ingakhoke kwakhethwa i-Egyptian National Authority for Remote Sensing and Space Sciences (NARSS) ukuze imele inyakatho ye Afrika; i-African Institute for Capacity Development (AICAD), impumalanga ne Afrika evela eKenya kanye nenhlango i-UbuntuNet Alliance (Malawi) emele umzansi ne Afrika.

Ubuntunet Alliance besebenzisana ne AfricArXiv babese basungula ukusebenzisa lengqalasisizinda ukuthi sibe yindawo lapho lonke ucwaningo lasezwekazi ye Africa lingatholakala khona kalula futhi isize nasekusakazeni ulwazi lutholakale mahala nangezilimi eziningina zase Africa.<sup>13</sup> Lamaqoqo olwazi uma egcinwe ngendlela ekahle kwenza ukuthi atholakale kalula, kusize ekufundiseni nasoncwaningeni ngesikhathi esizayo, kuvikele ukulahleka kolwazi futhi kukhombise amakhono abancwaningi base-Afrika. Lokhu kwenziwe ngokuthi AfricArXiv (izobe isitholakala kwi Ubuntunet Open Science Cloud) yakhe amaqoqo alolonke ocwaningi olwenzaka e-Africa ngoku:

- Ibe yenqalasizinda yokungcina amaqoqo olwazi.
- Ukuqeqeshe abancwaningi ngezindlela zokungcina imiphumela yocwaningo ukuze itholakale kalula yilabo abaludingayo.

## Investments in open scholarship toward bibliodiversity

The Ohio State University (Ohio State) is a large doctoral granting public research institution in the United States. The vision of Ohio State is to be “the model 21st-century public, land grant, research, urban, community-engaged institution.”<sup>14</sup> The university aims to live its shared values of excellence and impact, diversity and innovation, inclusion and equity, care and compassion, and integrity and respect to advance its core work of teaching, learning, research, and service.<sup>14</sup> In the 2023 fiscal year, Ohio State had \$1.45 billion in research and development expenditures.<sup>15</sup> To provide access to resources and materials that advance Ohio State’s teaching, learning, research, and service, University Libraries manages a materials budget of approximately \$14.6 million.

### *Investments in open scholarship*

University Libraries has supported open access scholarship for more than two decades—dating back to 2002 with the inception of our institutional repository program. Under its Transforming the Scholarly Publishing Economy (TSPE) strategic initiative,<sup>16</sup> now in its sixth year, University Libraries is intentionally focusing on directing library collection funds toward open access models in support of our mission to share knowledge with the people of Ohio, the nation, and the world.<sup>17</sup> Leveraging our institutional scale, as well as the scale of our consortia including OhioLINK and the Big Ten Academic Alliance (BTAA), TSPE seeks to build partnerships to transform the scholarly publishing marketplace in globally positive ways while stewarding Ohio State’s financial resources and making the research and scholarship of Ohio State’s faculty, staff, and students openly available.

The strategic investments University Libraries makes in open scholarship follow a multi-pronged approach and range from monetary support for open scholarly infrastructure and open access publishing to participation in the governance of open source, community-supported, and academy-owned scholarly publishing programs and platforms. The open access models we support<sup>18</sup> include diamond open access, green open access, Subscribe to Open, collective action, and gold open access via transformative and transitional agreements with journal publishers that waive open access fees for Ohio State authors.

The transformative and transitional agreements that University Libraries has entered into, beginning with our first in July 2020, have to date waived more than \$6.9 million in open access fees for Ohio State authors. Alongside supporting open access publishing in Ohio State’s top journal venues in terms of publishing output, supporting our humanities and social sciences scholars and the open access models of non-profit journal publishers including scholarly societies, university presses, and fully open access publishers is a priority of the TSPE strategic initiative. University Libraries currently has eight Read and Publish or Pure Publish agreements with non-profit publishers and five with commercial publishers. Ohio State’s publishing output, however, is heavily weighted toward the commercial publishers. Of the two thousand and eighty-two open access articles funded with our thirteen agreements to date, one thousand seven-hundred and thirty-seven, or eighty-three percent, are with the five commercial publishers (De Gruyter, Elsevier, Springer, Taylor & Francis, and Wiley).

To intentionally diversify the TSPE portfolio—and driven by University Libraries equity value<sup>17</sup>—we financially support diamond open access journals including multi-year commitments to the Lyris Open Access Community Investment Program (OACIP), the Open Library of Humanities, and Pluto Journals. This is in addition to the diamond open access journals that University Libraries publishes and hosts as part of our library publishing program which dates to 2007. University Libraries is also adding financial support to new Subscribe to Open programs that are an alternative to author-side payment models. A few examples include *Annual Reviews*, *Berghahn Open Anthro*, and *Demography*.

University Libraries is focusing this academic year on the continued expansion of its support for open access monograph publishing, prioritizing academy-owned and university presses. TSPE balances the open access subvention support University Libraries provides for Ohio State authors<sup>19</sup> with financial support for programs and initiatives that either eschew author-side payments (e.g., book processing charges (BPCs)) or that use membership funding to subsidize open access fees.<sup>20</sup> A few examples of the non-profit, open access programs and initiatives we support include MIT Press Direct to Open, the Open Book Collective ScholarLed presses (African Minds, Mattering Press, mediastudies.press, meson press, Open Book Publishers, and punctum books), and University of Michigan Press Fund to Mission.

## *Role of a large North American research library*

With the substantial resources of Ohio State, what is the effect on bibliodiversity at scale for where and how University Libraries and its consortia decide to lean in supporting open scholarship? How can a large North American research library best support its own researchers and effect positive change for researchers across the globe? These are questions with which the TSPE initiative grapples when deciding where to commit investments of expertise and funding. It is a balancing act that, especially with financial resources, can tip the scales in unintended ways given our outsized influence. Collectively the fifteen member institutions of the BTAA account for about fifteen percent of the publishing output in the United States.<sup>21</sup>

University Libraries recognizes that opening the scholarship of Ohio State for the world to read and reuse has the potential to perpetuate inequities in access to publishing if that open access is driven by author-side payment models. Our open access agreements that include covering the cost of article processing charges (APCs) and BPCs for Ohio State authors do prioritize supporting the read access to content and open access publishing benefits for our own researchers. But the TSPE initiative is also committed to equitable access to the benefits of open scholarship, and we financially support the open access models of non-profit publishers and university presses for journals and monographs that do not have author-side payments to read or publish. And, where possible with our author-side payment agreements, we add equity contributions to support unfunded or under-funded researchers and we negotiate for more favorable green open access publisher policies for journal portfolios.

The scalability and sustainability of equitable open access models, including diamond open access, green open access, and Subscribe to Open, are dependent upon the financial resources of member, contributing, subscribing and/or supporting organizations and institutions. The success of open access programs and initiatives not funded by author-side payment can also be critically dependent upon open source and community-supported open scholarly infrastructure. University Libraries has a long history of supporting open scholarly infrastructure as an institution and more recently as a member of the BTAA. Our institutional support for DSpace, an essential open source platform for open scholarship across the globe, spans two decades and includes financial support, code contributions, and serving in leadership roles in DSpace governance. As a member of the BTAA, University Libraries financially supports arXiv—a free-to-use open research-sharing platform—and serves in a leadership role in arXiv governance. Other examples of open scholarly infrastructure that University Libraries supports include the Directory of Open Access Books, the Directory of Open Access Journals, Fedora, OAPEN (Open Access Publishing in European Networks), and Public Knowledge Project's Open Journal Systems.

## **Epistemic injustice in scientific publishing**

Scholarly communication plays a key role in the recognition of expertise and the allocation of power within the academic community. It enables individuals to set research agendas and control knowledge production. Given its importance, it is crucial that scientific communication channels do not exclude authors based on their affiliation, background, or ability to pay. The deficiency of inclusivity within the scholarly publishing landscape serves as a manifestation of epistemic injustice. The concept of epistemic injustice was developed by M. Fricker. In her book, "Epistemic injustice: Power and the Knowledge of Knowing," she discusses two types of epistemic injustice—testimonial injustice and hermeneutical injustice. Testimonial injustice "occurs when prejudice causes a hearer to give a defeated level of credibility to a speaker's words," while hermeneutical injustice arises when an individual faces unfair difficulty understanding their own experiences due to a lack of societal provision of conceptual frameworks.<sup>22</sup> In a simplified manner, these forms of epistemic injustice could be framed as two straightforward questions: (1) Whose knowledge is considered valuable and reliable? And (2) Who gets access to knowledge?<sup>23</sup> Testimonial injustice emerges from the fact that testifying (i.e., sharing information to others) is dependent on how much credibility a hearer affords to a speaker, where level of credibility is defined by hearer prejudice based on a speaker's social status, education, ethnicity, etc. Applying this concept to the publishing system, we can consider a scenario where a manuscript submitted by an unaffiliated author is desk-rejected due to the editor's perceived credibility deficit of the author. Another example of a testimonial injustice is the author-side payment model for open access publishing (e.g., APCs) that systematically excludes researchers outside of the Global North from publishing in prestigious journals on non-meritocratic bases.<sup>24</sup> Knöchelmann argues that epistemic injustice is a core problem in scholarly communication, and vividly illustrates how minority groups face their testimony (research output) doubted or find themselves in situations where their experiences do not fit to the research agenda established by the hegemonic majority.<sup>25</sup>

## *The IDAHO project*

The IDAHO project is a two-year initiative led by the Leibniz Information Centre for Science and Technology aimed at fostering an inclusive, equitable, and diverse open access publishing culture. The project spans from October 2023 to



August 2025 with the primary objective to identify and describe the barriers and impediments to open access publishing encountered by researchers with weak institutional ties. By providing a comprehensive description of distinct hurdles, the project seeks to provide a nuanced understanding of obstacles that researchers outside of traditional academic settings face in their efforts to contribute to knowledge production and dissemination. This is particularly relevant in light of the current prevalence of open access agreements between publishers and institutions in pursuit of transforming the traditional subscription-based scholarly publishing system to open access. These open access agreements with publishers can lead to situations where a researcher's ability to publish open access is increasingly dependent on their affiliation status. As part of the project's practical approach, efforts will be directed toward developing recommendations to effectively eliminate or mitigate identified obstacles.

The project employs a mixed-method exploratory research design. It focuses on the perspectives of researchers regarding publishing open access. Adjacent topics, such as accessing academic library collections for members of unaffiliated communities,<sup>26</sup> or the challenges libraries encounter with subscription cost, are deliberately omitted.

The term "weakly affiliated" encompasses a heterogeneous cohort of individuals, including independent researchers, refugee scientists, citizen scientists, researchers employed by non-governmental organizations (NGOs), and researchers within industrial sectors (small and medium-sized enterprises). These individuals typically do not have publishing responsibilities but can be interested in meaningfully contributing to the knowledge enterprise. Previous research<sup>27</sup> suggests that when discussing independent researchers, we typically refer to a broad spectrum of individuals with diverse backgrounds and approaches to their work. These individuals can be categorized into four distinct groups. The first group includes individuals with extensive knowledge in a particular research field, who have left formal academic employment, but who are adept at conducting rigorous research of publishing quality. The second category comprises retired researchers who publish sporadically. Another group consists of formally affiliated researchers who deliberately choose not to disclose their institution in publications. Finally, the last group is represented by transitioning researchers undergoing prolonged institutional changes.

The project is currently progressing to its empirical phase, which involves conducting qualitative interviews with both researchers and publishers, as well as quantitative surveys validating the findings. The initial stage involved a systematic literature review. Subsequently, a final workshop will be conducted to discuss the findings and derive recommendations. The partners of the IDAHO project include the Institute for Globally Distributed Open Research and Education (IGDORE), Science for Ukraine NGO, and Electronic Information for Libraries (EIFL).

### *Проект IDAHO (The IDAHO project repeated in the Ukrainian language)*

Проект IDAHO — це дворічна ініціатива, яку очолює Лейбніцький інформаційний центр науки та техніки, яка спрямована на розвиток інклюзивної та справедливої культури поширення результатів наукових досліджень у відкритому доступі. Проект триває з жовтня 2023 року по серпень 2025 року і має на меті виявити та описати бар'єри і перешкоди з якими стикаються дослідники без сталої афіліації під час публікації своїх наукових статей у відкритому доступі через висвітлення цих перешкод, проект прагне привернути увагу до труднощів, пов'язаних з поширенням знань, з якими зіштовхуються дослідники, що працюють поза межами традиційного академічного середовища. Актуальність проекту зумовлена популярністю трансформаційних угод між видавцями та науковими установами, що є одним з методів переходу від традиційної системи видавництва наукової літератури до відкритої моделі наукової комунікації. З огляду на умови укладання таких угод, можливість дослідників публікувати свої роботи у відкритому доступі на пряму залежить від їхньої афіліації. Завдяки практичному підходу проекту особлива увага буде зосереджена на розробці рекомендацій для ефективного усунення або пом'якшення виявлених перешкод.

Для досягнення поставленої мети у проекті використовуються змішані методи дослідження. Важливо зазначити, що дослідження проблем публікації у відкритому доступі розглядаються з точки зору дослідників. Суміжні теми, такі як доступ до фондів академічних бібліотек для користувачів, які не належать до академічної спільноти,<sup>26</sup> або проблеми з якими стикаються бібліотеки через вартість передплати, не розглядаються.

Термін "науковці без стійкої афіліації" охоплює широке коло осіб, включаючи незалежних дослідників, вчених-біженців, представників громадської науки (citizen science), дослідників, які працюють у неурядових організаціях, а також науковців з промислового сектору (малих і середніх підприємств). Згідно з попередніми дослідженнями,<sup>27</sup> термін "незалежні дослідники" охоплює різномірну групу осіб із різним досвідом та підходами до своєї роботи. Цих дослідників можна поділити на чотири окремі групи. Перша група включає осіб із ґрунтовними знаннями у конкретній науковій галузі, які залишили академічну

кар'єру, але продовжують проводити якісні наукові дослідження, що відповідають високим стандартам публікаційної якості. Друга категорія включає дослідників, які вийшли на пенсію, але продовжують активно займатися науковою діяльністю. Ще одна група складається з формально афілійованих дослідників, які з певних причин свідомо не вказують свого роботодавця під час публікації наукових досліджень. Нарешті, остання група представлена дослідниками, які перебувають на етапі переходу від однієї організації до іншої.

Наразі проєкт перебуває на емпіричному етапі, що передбачає проведення якісних інтерв'ю як з дослідниками, так і з видавцями наукової літератури. Крім того, заплановано проведення кількісного опитування для верифікації отриманих результатів. Попередній етап проєкту включав проведення систематичного огляду літератури. Фінальний етап проєкту передбачає проведення семінару для обговорення отриманих результатів та розробки рекомендацій. Партнерами проєкту IDAHO є Institute for Globally Distributed Open Research and Education (IGDORE), громадська організація "Science for Ukraine" та неприбуткова організація "Electronic Information for Libraries."

## **Equitable open research infrastructure**

The open research infrastructure refers to the interconnected system of tools, platforms, identifiers, and resources that support open and transparent research practices. It includes a wide range of digital and physical resources designed to facilitate the sharing, collaboration, and reproducibility of research outputs across disciplines and geographical boundaries. Open research infrastructure includes repositories for storing and sharing research data and publications, collaborative platforms for conducting research collaboratively, and tools for managing and analyzing research data.<sup>28</sup> Organizations across the community have launched various initiatives such as the Principles for Open Scholarly Infrastructures (POSI, version 1.1) that highlights the importance of robust infrastructure for open scholarship. POSI provides a set of principles to help organizations that support scholarly communications demonstrate their move toward a more open and accessible landscape and help in maintaining a successful operation and long-term sustainability of open infrastructure.<sup>29</sup>

An equitable open research infrastructure is a fundamental pillar in fostering inclusivity and democratizing access to scholarly resources and knowledge. By removing barriers to access and participation, equitable open research infrastructure ensures that individuals from diverse backgrounds, regions, and institutions have fair and equal opportunities to engage in the research process. Also, the equitable open research infrastructure prioritizes the needs of underrepresented communities, addressing issues of financial capacity, underlying technical infrastructure, language diversity, knowledge gaps, and accessibility to ensure that everyone can contribute to and benefit from the global pool of knowledge. Through its commitment to equity and inclusivity, an equitable open science infrastructure advances the collective pursuit of knowledge and innovation, fostering a more inclusive, collaborative, and impactful research ecosystem.<sup>30</sup>

## **Persistent identifiers and emerging research communities**

In today's rapidly evolving academic landscape, institutions and researchers face the challenge of ensuring that their work has lasting impact. Persistent Identifiers (PIDs) play a crucial role in fostering the growth of research communities by providing a reliable mechanism for uniquely identifying and referencing scholarly outputs and resources. Also, they could help in saving the research sector money<sup>31</sup> and reducing researchers' wasted time in administrative tasks.<sup>32</sup> While there are different types of PIDs, the Digital Object Identifier (DOI) stands out as one of the most widely recognized within the scholarly community, emphasizing its dedication to ensuring persistence. As emerging research communities evolve and produce various types of research outputs, such as datasets, software, samples, and preprints, PIDs ensure their long-term accessibility, discoverability, and citability. By assigning PIDs to these diverse research outputs, emerging communities can effectively connect their work into the broader scholarly ecosystem, facilitating collaboration, reproducibility, and impact assessment.

However, there are several barriers and challenges for increasing the adoption of PIDs among emerging communities such as low levels of awareness about the benefits of PIDs, a lack of underlying research infrastructure, and financial barriers for some communities. To address this, DataCite<sup>33</sup>—a global community that shares a common interest to ensure that research outputs and resources are openly available and connected—and other infrastructure providers have developed equitable access and participation programs to overcome these challenges and work together toward building a more equitable research ecosystem.<sup>34</sup>

### *DataCite's global access program*

The DataCite global community comprises more than three thousand repositories and supports more than fourteen hundred organizations around the world. In line with DataCite's vision in connecting research and advancing knowledge and as part of its multi-year strategic plan,<sup>35</sup> we started to focus our efforts on exploring ways to remove access barriers and increase adoption and participation on a global scale. Hence, DataCite introduced the Global Access Program (GAP)<sup>36</sup> as one of the organization's strategic initiatives in 2023. GAP is designed to increase access to and adoption of PIDs services and infrastructure for communities across Africa, Asia, the Middle East, and Latin America.<sup>37</sup> DataCite has taken a comprehensive approach with GAP, and that approach has three main aspects:

- **Outreach.** We analyzed needs and education opportunities across the GAP regions. This analysis informs the development of targeted educational webinars, best practices guides, and policy resources. To foster collaboration, DataCite actively sought partnerships and platforms of collaboration in these regions. We significantly increased our engagement with regional communities through various multilingual webinars in Arabic, English, French, Spanish, and Turkish and we increased our presence at in-person events across GAP regions. The DataCite Ambassadors Program and the DataCite Consortia Partnership Program are two key initiatives that exemplify this commitment toward global engagement. The DataCite Ambassadors Program empowers a network of dedicated volunteers to raise awareness, foster collaboration, and promote best practices within their regional communities. The DataCite Consortia Partnership Program creates a collaborative network of Consortium Leads committed to advancing the adoption of DataCite services and infrastructure while promoting best practices for leading a DataCite Consortium, supporting consortia globally. DataCite further complements these outreach efforts by publishing case studies showcasing how diverse stakeholders are leveraging DataCite's infrastructure to enhance research data management practices.
- **Infrastructure.** Within this aspect, we analyzed the existing infrastructure landscape and platform usage across different regions. This knowledge informs collaborations with repository platforms and service providers to develop integrations tailored to specific regional needs. The end goal is to establish user groups that allow participants to benefit from each other's expertise and potentially reuse code for integration purposes.
- **Funding.** In 2023, we launched a Global Access Fund (GAF) to enable organizations across Africa, Asia, the Middle East, and Latin America to make their research outputs discoverable. DataCite GAF provided financial support for both outreach activities and infrastructure development to enable organizations in these regions and communities currently underrepresented in the global open science infrastructure landscape to benefit from our PIDs infrastructure. The funding program was successful with more than one hundred and eighty-five applications received. After a thorough review process, we announced twelve awarded organizations from Argentina, Brazil, Côte d'Ivoire, Georgia, India, Indonesia, Mexico, Nigeria, Tunisia, Lebanon, Uganda, and Zimbabwe.<sup>38</sup> We are currently working toward the launch of the 2024 GAF.

The Global Access Program was an important mechanism to enable and increase global engagement. Within the first fourteen months of the GAP program, DataCite welcomed several new direct members, and twenty-eight new Consortium Organizations joined our community across the regions. DataCite is dedicated to enhancing the adoption of PIDs globally in the pursuit of an open research infrastructure and an equitable research ecosystem, where research outputs from emerging communities are not only findable and accessible, but also more discoverable and citable within the global research landscape. By expanding the reach of PIDs, we aim to empower researchers and communities worldwide, ensuring that they have the tools and resources that are necessary to effectively share their work. Organizations and individuals are encouraged to join GAP in this endeavor, contributing to the broader mission of advancing global research accessibility and equity.

### **Inclusive metadata**

#### *Indigenous knowledge in metadata practices (authored by Katherine Witzig)*

To effectively contextualize my professional experiences, I will first share my positionality. I am a middle-aged, queer, disabled, and Indigenous woman who is a citizen of the Choctaw Nation of Oklahoma. Though I was not raised in my culture, I have focused on immersing myself in Indigenous community and sharing my and many other Indigenous voices as we, together, share a nuanced view of being a contemporary Native American.

I had the privilege of attending university and I graduated with a Bachelor of Arts degree in English in 2015 and a Bachelor of Arts degree in Spanish in 2022. I currently work and attend graduate school full time and expect to receive my



Master of Library and Information Science degree in Spring 2024. Additionally, I volunteer with state and national library associations, and through these connections I work to incorporate Indigenous knowledge into existing metadata systems.

In the fall of 2022, I participated in a Creating Subject Headings for Indigenous Topics training workshop in which several librarians who routinely work with metadata in their institutions shared practices for seeking out the names of tribal nations with which they refer to themselves. Attendees were also trained in the process of submitting forms for reconsideration of Library of Congress Subject Heading terms so that the newly obtained information from the tribal nations could be used as acceptable justification (known as literary warrant) for making the systemic change. In addition to joining the workshop as a participant, I served as an advisory board member to review the final guide through an Indigenous lens. The resulting manual<sup>39</sup> was distributed in print form to tribal libraries across the United States.

I connected with other information professionals through this training program and opened a line of communication with a metadata justice initiative in Oklahoma focusing on Indigenous tribal nation and place names.<sup>40</sup> The justice initiative proactively seeks the perspectives of Indigenous people and consulted with me individually and as a member of the Oklahoma Library Association's Committee for Tribal Libraries, Archives, and Museums (commonly referred to as the Tribal Libraries Committee, or TLC).

In addition to my local work, I also serve as the co-chair for the PCC Task Group for Metadata Related to Indigenous Peoples of the Americas. The group has a considerable mandate<sup>41</sup> that includes:

- creating a statement on the historical damage of traditional cataloging practices and another statement encouraging the use of reparative metadata practices;
- researching the capabilities of large library systems to use Indigenous languages in UNICODE;
- researching alternative vocabulary standards to which the Library of Congress might refer, especially on Indigenous topics; and
- recommending changes to the Library of Congress classifications and subject heading authorities for Indigenous names, places, and topics.

In an effort to create a more expansive and nuanced view of current work in the field, the Task Group is currently soliciting feedback via a survey<sup>42</sup> from professionals who work with Indigenous-related metadata in any setting.

### *Respectful partnership for more inclusive practices (authored by Katherine Witzig)*

My work with TLC has focused on connection and relationships, a fundamental tenet of an Indigenous way of being. In line with the idea of “being in good relation,” TLC has focused on supporting tribal and Indigenous librarians through the sharing of resources, time, and camaraderie. The Resource List<sup>43</sup> is an online, freely accessible collection of news from Indian Country, professional development opportunities for those in information work, grant and funding notices, as well as recommendation lists for popular media, and information about Indigenous vendors, suppliers, and events. Though some of the resources are focused on the specific experience of local information professionals, much of the content is regional or national and can be relevant to information work in other places across the United States. Resources and groups such as these are essential to a state with a history stained by the forcible relocation of many sovereign nations. The thirty-nine tribal nations that currently reside in Oklahoma make significant contributions to the well-being of the state and all its people, and efforts are growing to recognize their work.

I have received questions from other (especially non-Indigenous) library professionals on how to create and maintain beneficial relationships with local tribal nations. In response, I developed the “Creating Cultural Connections” presentation, delivered in video format for the University of Illinois Urbana Champaign's Spring 2023 Student Showcase and delivered in-person to the Eastern Oklahoma Library System; the latter presentation was followed by a panel discussion on the topic where I was joined by a representative of the United Keetowah Band of Cherokee Indians' Education Department and a representative of the Cherokee Nation. This topic was covered again by a poster presentation at the 2024 Oklahoma Library Association Annual Conference, where it was well-received and fostered many excellent conversations.

Creating these partnerships will be an ongoing conversation, and it is my professional prerogative to foster meaningful connections for the benefit of my Indigenous community.

## **Conclusion**

The push and pull of the local and the global, the community and the “biblioverse,” the greater good and the bottom-line, and the seen and the unseen is evident across the perspectives shared in this paper. Individually, we look to make a difference

from where we are, with who we are, and with an understanding of the influence that we have. Together, we recognize the essential importance of an inclusive system of scholarly communication. Our approaches to fostering bibliodiversity in scholarly publishing align, diverge, and conflict as we each work to support a future where our communities have a voice, and every voice can be heard. The challenge we have before us is to find solutions that collectively work to support bibliodiversity—solutions toward a future where the local supports the global and the global is good for the local.

## Statements and declarations

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