Project on Open and Evolving Metaliteracies (POEM)

Introduction

The Carnegie Mellon University (CMU) Libraries seeks $249,961 for a 24-month National Leadership Grant (NLG) for Libraries implementation project grant for *Project on Open and Evolving Metaliteracies* (POEM), an iterative, peer-reviewed, curated, bilingual collection of reusable and remixable[1] open educational resources designed to enhance a range of information literacies in learners of high school age and above**.** POEM will initially be focused on three key literacy areas: algorithm and AI literacies; data and computational literacies; and media and (dis)information literacies. As an open resource aimed at a variety of publics and published by an institution with a reputation for excellence in AI, POEM will meet NLG Program Goal 1, "Build the workforce and institutional capacity for managing the national information infrastructure and serving the information and education needs of the public." In both its replicable form (an openly licensed, free, remixable set of resources) and its literacy-focused content, it meets NLG Objective 1.1.

Project Justification

The widespread implementation of automated decision-making compounds existing social and financial inequities and exacerbates social divisions. Increasingly ubiquitous, intuitive, proprietary user interfaces obfuscate computational processes to present only "automagical" results[2]. At the same time, US citizens are barraged with the presentation of "faster, cheaper, easier to make"[3] falsified media content,[4] misleading data visualizations,[5] and selective and biased data as truth.

In an increasingly complex media and mediated environment, the importance of literacy, fluency, or competency has expanded from a focus information literacy, or "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" to encompass a range of digital fluencies, particularly those pertaining to computation, data, and mis/disinformation, all parts of what ACRL has called our "dynamic and often uncertain information ecosystem."[6]

Over the course of the last eighteen months, that information ecosystem has been wholly disrupted by the mass availability of generative AI chatbots such as ChatGPT, and the threat of the same for software such as SORA AI[7], which promises to give ordinary people instant access to what the *New York Times* described as "the ability to create talking

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[1] The five Rs of open educational resources, coined by David Wiley in 2014, are reuse, retain, revise, remix, and redistribute. See https://uidaho.pressbooks.pub/oerstarterkitpm/chapter/chapter-1-introduction-to-open-educational-resources/.

[2] A key element of data literacy is what Gray, Gerlitz, and Bounegru called, in a 2018 Big Data & Society article, "data infrastructure literacy," or the "the ability to account for, intervene around and participate in the wider socio-technical infrastructures through which data is created, stored and analysed." https://doi.org/10.1177/2053951718786316

[3] "How AI-Generated Misinformation threatens election integrity" https://www.pbs.org/video/ai-the-election-1707859426/

[4] For the threat to democracy posed by AI-enabled robocalls that can clone candidate voices and deepfake videos that are difficult to tell from real media, see "Disinformation on Steroids: Is the US prepared for AI's influence on the election?" https://www.theguardian.com/us-news/2024/feb/26/ai-deepfakes-disinformation-election

[5] In the 2019 keynote of the IEEE conference, Katy Börner described visualization literacy as an "essential skill" and IEEE proceeded to produce a special issue of IEEE Computer Graphics and Applications on visualization literacy in late 2021. https://doi.org/10.1109/MCG.2021.3117412.

[6] https://www.ala.org/acrl/standards/ilframework

[7] https://www.sciencefocus.com/future-technology/openai-sora

digital puppets,"[8] and the Guardian as "mis- or disinformation on steroids."[9] As we move into the second quarter of the 21st-century, we see people not only used by but shaped by algorithms as well: they mediate and determine the type of information people see, the kinds of ideas that they interact with, and even the communities they belong to online. When access to information is restricted not by paywalls but by previous interactions, likes, purchases, and browsing habits; when we are trained to favor the ease of the set menu over the adventure of the à la carte, we steadily lose agency over the inputs that shape our understanding of the world.

AI is not a future technology. As William Gibson somewhat apocryphally noted, "The future is already here. It's just not very evenly distributed." Indeed, as early as 2017, a Pew Research Center survey had determined "a great need for education in algorithm literacy."[10] As part of that study, David Lankes, now Virginia & Charles Bowden Professor of Librarianship at the University of Texas at Austin's School of Information, said "unless there is an increased effort to make true information literacy a part of basic education, there will be a class of people who can use algorithms and a class used by algorithms."[11] Those *used by* suffer because of the decisions based upon the bias built into them—what Dr. Arshin Adib-Moghaddam calls "data polluted by a set of myths from the age of 'enlightenment.'"[12] The gaps between those who can work with data and those who cannot,[13] between those who scrape, harvest, and otherwise collect data in the interest of capital and those that simply (and often unwittingly) provide it, also makes data literacy education, as Evan Shapiro puts it, "a matter of survival." Shapiro, co-author of a 2023 national survey on attitudes towards data collection and usage that found that more than two-thirds of the 45,000 U.S. adults surveyed don't understand how their data are being used[14], sees being literate about how data is gathered, used, and abused as absolutely crucial, "whether that's having your privacy hacked, and your identity stolen, or posting something that ends your career prospects."[15] Catherine D'Ignazio goes further still, equating data literacy not just with survival but, after Freire, with emancipation: "literacy involves not just the acquisition of technical skills but also the emancipation achieved through the literacy process." [16]

Being literate in a given area, as librarian Nicole Hennig notes of AI literacy, "can help people cut through the hype and find a balance between polarizing extremes."[17] Nowhere is this perhaps more urgent than in the realm of media and disinformation literacy. As early as 2001, the American Academy of Pediatrics began encouraging schools to develop media literacy programs, alarmed by the fact that the hours spent with electronic media "are highest among poor students of color, exceeding six and one-half hours per day." By 2007, as Jeffrey M.R. Duncan-Andrade, Codirector of the Educational Equity Initiative at San Francisco State University's Cesar Chavez Institute, points out in an article entitled *Urban Youth and the Counter-Narration of Inequality*, scholars were calling for "a critical media literacy pedagogy that empowers urban youth to deconstruct dominant media narratives, develop much-needed academic and critical literacies, and create their own counter-narratives to the media's largely negative depictions of urban youth and their communities."[18] Some progress has been made since 2007: a 2024 survey from Boston University's College of Communication found that 50% of Black Americans and one third of White Americans reported that their local public schools and libraries offer media literacy education, an improvement that causes Michelle Amazeen, the College's

[8] https://www.nytimes.com/2023/02/07/technology/artificial-intelligence-training-deepfake.html
[9] https://www.theguardian.com/us-news/2024/feb/26/ai-deepfakes-disinformation-election
[10]https://www.pewresearch.org/internet/2017/02/08/theme-7-the-need-grows-for-algorithmic-literacy-transparency-and-oversight/
[11] Ibid.
[12] https://blogs.lse.ac.uk/medialse/2023/09/25/for-minorities-biased-ai-algorithms-can-damage-almost-every-part-of-life/
[13] For more on data haves and have nots, see Boyd and Crawford (2012), Andrejevic (2014), and Crawford again (2016).
[14] "It's All Personal: A Study on Consumer Attitudes Towards Data Collection and Usage" https://insights.pch.com/img/data-ethics-design.pdf
[15] https://www.edweek.org/technology/ai-is-making-data-literacy-a-survival-skill-that-schools-must-teach-experts-argue/2023/11
[16] https://doi.org/10.1075/idj.23.1.03dig p.6
[17] https://www.choice360.org/libtech-insight/a-tech-librarian-explains-how-to-build-ai-literacy/
[18] https://www.journals.uchicago.edu/doi/epdf/10.1525/tran.2007.15.1.26

associate dean for research, to state that "that particularly for underrepresented communities who are often targets of disinformation efforts, media literacy education at the local level – at public schools and libraries – holds promise."[19] Over just the last two years in the US, there has been a substantial increase in the presence of media literacy in middle- and high-school curricular frameworks and requirements:[20] over 19 states have now taken legislative action to promote media literacy education, and many of these modules have developed in coordination with state librarian associations.[21] But, as Amazeen says, "Just when we need trusted information more than ever, our media ecosystem is poised for a tsunami of deliberately false content intended to mislead, supercharged by the use of generative artificial intelligence. Most but not all people, we found, understand they need to have new skills to deal with it."[22] Data science and data literacy education requirements are also on the rise;[23] undoubtedly, algorithm and AI literacy programs will be next.

Despite this urgency, school librarians—often the people best equipped to teach literacy in the classroom—are increasingly deemed an unaffordable luxury in cash-strapped public education systems. Indeed, according to the 2021 "School Librarian Investigation – Decline or Evolution?" report, in 2018-2019, almost 3.1 million students in predominantly Hispanic districts and almost 4.8 million students in predominantly non-white districts did not have a school librarian. The numbers dipped by about 5% during the pandemic and have not risen since.[24] Classroom teachers, for their part, may feel unequipped, undertrained, or otherwise unable to create lessons in the rapidly evolving spaces of media and disinformation, data and computation, and AI. Some resources exist, or course, even if they are almost exclusively anglophone and often—as in the case of Common Sense Education's work—not licensed for remixing or reuse. Current work in the media literacy sphere includes the Center for News Media at Stony Brook University's Digital Resource Center,[25] which features lesson plans, exercises, and activities for 6-12 and college students on the topic of news literacy; the Center for Media Literacy's *Educator Resources*[26]*;* Common Sense Education's scant modules on News and Media Literacy for ninth to twelfth graders;[27] and 2021's *Critical Media Literacy and Civic Learning*, an open textbook aimed at K-12 students and teachers. When it comes to AI literacy, high school teachers and their students have Common Sense Education's *AI Literacy Lessons*; the Algorithm & Data Literacy Project,[28] a Canadian set of discussion guides and worksheets for high school-age children and their teachers; and UNESCO's *AI Competency Frameworks for Teachers and School Students*,[29] currently available in draft form.

While it is clear that the need for metaliteracy education in our current information environment is now recognized at the national and international levels, opportunities for formal curricular engagement in all three literacy areas fall off after high school, leaving librarians to fill in the gaps with "one shot" information literacy sessions and workshops. While

[19] https://www.bu.edu/com/articles/media-literacy-skills-important-to-counter-disinformation-survey-says/

[20] A CivX study found that of the 75% of surveyed schools that required some form of media literacy in 2023, 50% had not required it in 2021.

[21] Media Literacy Policy Report 2023 p.18 https://medialiteracynow.org/document/u-s-media-literacy-policy-report-2023/

[22] https://www.bu.edu/com/articles/media-literacy-skills-important-to-counter-disinformation-survey-says/

[23] https://www.edweek.org/teaching-learning/students-need-better-more-data-science-skills-here-are-5-ways-schools-can-help/2023/09

[24] The report is the subject of a 2023 *Peabody Journal of Education* article entitled "The School Librarian Equity Gap: Inequities Associated with Race and Ethnicity Compounded by Poverty, Locale, and Enrollment"

[25] https://digitalresource.center/

[26] https://www.medialit.org/educator-resources

[27] https://www.commonsense.org/education/digital-citizenship/curriculum?topic=news--media-literacy&grades=9%2C10%2C11%2C12

[28] https://algorithmliteracy.org/

[29] https://www.unesco.org/sites/default/files/medias/fichiers/2023/12/UNESCO-Draft-AI-competency-frameworks-for-teachers-and-school-students_0.pdf

librarians have been teaching data and information literacy for years, as ACRL President-Elect Leo Lo has recently shown,[30] many of them feel ill-equipped to teach algorithmic literacies, even while many others are prepared to do so.

However, there is currently no comprehensive, reliable clearinghouse of non-commercial materials that information professionals and 9-12 and postsecondary educators can use to undertake what is now a critical effort to increase algorithm, data, and media literacy. POEM aims to supplement existing resources, its co-editors and topic editors curating and peer-reviewing teaching and learning objects (such as assignments, rubrics, syllabi, in-class exercises, digital projects, executable notebooks, etc.) in a range of modalities and for a range of learning styles in English and in Spanish and bringing them into conversation with each other through a robustly indexed set of tags. POEM is designed to be used by high school and college instructors and librarians in search of flexible, reliable, peer-reviewed, open educational activities designed to improve levels of student and youth literacy, initially in three main fields: algorithmic and AI literacy; data and computational literacy, and media and (dis)information literacies. It takes as its baseline the ACRL Frameworks for Information Literacy and Visual Literacy in Higher Education and builds on the work of many of the initiatives and publications cited here, and will engage with the project team of Cornell University's IMLS-funded "Open Educational Resources on Algorithmic Literacy" project.[31] The goal of POEM is to ensure that high school and college teachers and librarians, as well as independent learners, have access to vetted teaching and learning materials that can help them gain the skills not only to understand the contemporary knowledge landscape but to critically evaluate it, take control of their own engagement with it, and work within it as informed actors rather than passive consumers.

Project Work Plan

POEM is not a publication *on* teaching literacies, but a publication *for* teaching them, a collection of usable and remixable teaching and learning objects that librarians, teachers, and faculty members can adopt for their own uses. The publication will be divided into three sections: algorithm and AI literacies; data and computational literacies; and media and (dis)information literacies, each under the charge of teams of two co-editor librarians who will (a)write introductory essays to the literacy area for which they are responsible and (b) organize that literacy area into a set of ten keywords, or topics. The co-editors will recruit a topic editor for each keyword, drawing from a wide range of institution and library types to ensure that all target groups are represented. These topic editors will each create a short introduction to their keyword and put out a call for teaching and learning objects corresponding to it, with the goal of initially publishing around ten per topic. The teaching and learning objects, which must already be or will be openly licensed, may not yet have been created or may already exist on someone's hard drive or syllabus; it is in bringing them together as a Findable, accessible, interoperable, reusable (FAIR)[32] collection that POEM can have maximum impact.

Given its tentacular structure, POEM will involve a large number of expert contributors and entail significant project management and collaboration. Project Director and CMU Libraries' Associate Dean for Academic Engagement Dr. Nicky Agate will serve as overall project manager and editor-in-chief and will be responsible for adherence to the timeline of activities set out below. She has extensive experience managing digital publication and digital humanities projects, including the MLA's *Digital Pedagogy in the Humanities* (https://digitalpedagogy.hcommons.org/) on whose structure POEM is modeled; developing courses both at the college level and for the *Force11 Scholarly Communication Institute*, as well as serving on editorial boards, including those of ATLA Press and the *Journal of Librarianship and Scholarly Communication*. She will liaise with both the CMU technical team and the co-editorial team to ensure that website

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[30] Lo, Leo S.. "Evaluating AI Literacy in Academic Libraries: A Survey Study with a Focus on U.S. Employees." (2024). https://digitalrepository.unm.edu/ulls_fsp/203

[31] https://www.imls.gov/sites/default/files/project-proposals/re-254893-ols-23-preliminary-proposal.pdf

[32] https://www.go-fair.org/fair-principles/

development and editorial work occur in tandem and on schedule. She will present the project at ALA, SXSW EDU, and UNESCO's Global Media and Information Literacy Week.

Each of the three literacy areas will have two co-editors, a CMU librarian and a librarian chosen from an open call. Haoyong Lan, Engineering librarian and a doctoral student in engineering education at the University of Pittsburgh, will be the CMU co-editor for algorithmic and AI literacy; Dr. Emma Slayton, CMU's data education librarian with a PhD in computational archaeology, will co-edit the data and computational literacy section, and Charlotte Kiger Price, Arts and Humanities librarian and a third-year EdD student in the Communication, Media, and Learning Technologies Design program at Columbia University's Teachers College, will serve as co-editor of the media and (dis)information literacy section. The co-editors will draw up an overview of existing projects in their literacy area and in consultation with the other co-editors, propose and refine a set of ten keywords, or topics, to be covered for each literacy. They are also responsible for project managing their section of POEM: co-authoring the call for topic editors, selecting a diverse team of topic editors from that pool, and meeting regularly with their topic editors to ensure the project proceeds according to its timeline. Finally, they will write a general, well-researched introduction to their literacy area and the teaching and learning objects contained therein and each present the volume at at least one conference in their field.

A total of thirty topic editors will be chosen from an open call that will go out to community college, public, and high school libraries as well as college and research libraries via American Association of School Librarians, the Young Adult Library Services Association, and the Association of College and research Libraries as well as the American Indian Library Association, the Asian/Pacific American Librarians Association, the Black Caucus of the ALA, the Chinese American Librarians Association, and REFORMA to ensure that these perspectives are included in defining the project's keywords and content. As these librarians also represent the envisaged target groups for the material, their input into the content, modalities, and learning objectives of each topic module will be essential. They will be responsible for (a) writing an introduction to the keyword concept, (b) in collaboration with their co-editors, writing two calls for teaching for learning objects over the course of the grant, (c) ensuring that the teaching and learning objects grouped under their keyword represent a diverse range of perspectives, voices, learning modalities, and methods, (d) ensuring that each teaching and learning object is tagged with the appropriate audience, educational level, learning objective, modality, and language and (e) that each teaching and learning object undergoes peer review by other members of the topic editor team.

Jonathan Kiritharan, CMU Libraries' Web & Applications Developer, and Talia Perry, the Libraries' Digital Publishing Specialist, will build the web interface (see *Digital Products Plan*) that will allow users to engage with POEM's three literacy areas, its keywords, and the editors' introductory statements, as well as search and filter the teaching and learning objects by audience, educational level, learning objective, modality, and language.

A team of paid student translators from CMU's MA Program in Global Communication and Department of Modern Languages will translate the CFPs, the various introductions, and, where technically possible, the teaching and learning objects from and into English and Spanish.

An accessibility expert will consult with the editorial team to determine requirements for contributions in a range of modalities prior to the issue of the call for content and will review all materials prior to publication.

Project kickoff: August 2024-September 2024

- *Call for inaugural co-editors for each of the three literacies:* The project director and the CMU co-editors will write a call for co-editors by August 7.

- *Translation of Call for Co-editors*: A graduate student will translate the *Call for Co-editors* by August 15.
- *Send out call:* the call for co-editors will be sent to community college, public, and high school library communities as well as college and research librarians to ensure that these perspectives are included in defining the project's keywords and content. The call will go out by August 15 with a deadline of September 1.
- *Translation of Call for Co-editors*: A graduate student will translate the *Call for Co-editors* by August 15.
- *Selection of co-editors*: The non-CMU co-editors will have been selected and notified by September 15. Applications will be assessed based on teaching experience, topical knowledge, project management experience, and target group representation.
- *Platform Development:* Talia Perry and Jonathan Kiritharan will consult with the development team at the Modern Language Association in early August to learn from their experience building *Digital Pedagogy in the Humanities*, the project upon which POEM is based.

October 2024–December 2024
- *Accessibility requirements*: The editorial team and the website development team will meet with an accessibility consultant to determine accessibility requirements for the project by October 15.
- *Platform Development:* Talia Perry and Jonathan Kiritharan will create a technical project timeline and begin wireframing the website design for review by the CMU academic engagement team (a team of subject liaisons and functional specialists) and, via Zoom, with the colleagues of the non-CMU co-editors, in early December.
- *Determination of keywords and community feedback*: The six co-editors and the project director will meet and determine the ten keywords for each literacy area. By November 15, they will have presented these to (a) a meeting of the CMU Libraries academic engagement team and (b) a Zoom meeting of the library colleagues of each of the non-CMU co-editors, representing a wide variety of institutional types and contexts, for comment and feedback. By December 1, they will have a finalized set of keywords and the draft of the call for topic editors.
- *Translation of keywords and call for topic editors:* A graduate student will translate these items by December 15; the translations will be reviewed by another graduate student translator before being sent out in early January.

January 2025–May 2025
- *Call for topic editors:* The project director and the six co-editors will send out the finalized call for topic editors in early January. The selection will take place by February 15, at which point the whole editorial team will have several meetings to determine learning objectives in the form of a competency framework that will guide topic editors in the selection of teaching and learning objects for their keyword.
- *Topic editor onboarding*: The topic editors will be onboarded by the co-editors and project director by March 1
- *Accessibility meeting*: In March, the editorial team will meet with an accessibility expert to determine accessibility requirements for contributions in a range of modalities.
- *Literacy-specific meetings*: The editorial teams for each of the three literacies will meet weekly between March 1 and April 15
- *First call for contributions of teaching and learning objects:* By March 30, the co-editors and topic editors will have written a call for contributions of teaching and learning objects to the collection. These might take the form of in-class exercises, syllabi, interactive notebooks, videos, podcasts, or other creative and/or technical activities and exercises, each accompanied by a short description contextualizing its intended audience and use.
- *Translation of call for contributions of teaching and learning objects*: By April 15, a graduate student translator will have translated the call for teaching and learning objects. The bilingual call will go out by April 20, with abstracts due by June 30.
- *Keyword introductions*: Topic editors begin writing their introductions to their keywords on May 1. These are due by August 30.

- *Iterative Platform Development:* Talia Perry and Jonathan Kiritharan will complete the first iteration of the website, based on the fall feedback, by April 30. It will be reviewed by the entire editorial team—co-editors, topic editors, and the editor-in-chief—in May in a series of focus groups. As part of the development process, Perry and Kiritharan will also test the website's integration with Kilthub, CMU's institutional repository, which will house and mint a DOI for each teaching and learning object in the collection.

June 2025–September 2025
- *Content:* Abstracts of teaching and learning objects due by June 30. Teaching and learning objects and activities will be reviewed for their alignment with the learning objectives and their potential to help students from a range of backgrounds, perspectives, and learning styles critically engage with the topic or keyword. The topic editors and co-editors will make their selection by July 15, with full objects due by September 10.
- *Content:* Topic editor keyword introductions due August 30.
- *Second call for contributions of teaching and learning objects*: Because all these areas are evolving rapidly, the topic editors will write a second call for teaching and learning objects over the month of August.
- *Translation of second call*: By September 15, a graduate student translator will have translated the second call for teaching and learning objects. The bilingual call will be disseminated starting September 16 with abstracts due November 30.
- *Introductions:* Co-editors begin writing their introductions to their assigned literacy September 15. These are due by November 15.
- *Peer review*: By the end of September, co-editors assign teaching and learning objects to topic editors and contributors, as well as to a volunteer team of students representing the full swath of target institutional types, for peer review; these are due October 31. The project director and the co-editors will peer review the keyword introductions written by the topic editors; these are also due by the end of October.
- *Platform development:* Perry and Kiritharan continue to work on website, iterating based on feedback from the May sessions.

October 2025–December 2025
- *Content:* Abstracts of second round of teaching and learning objects due by November 30. Teaching and learning objects and activities will be reviewed for their alignment with the learning objectives and their potential to help students from a range of backgrounds, perspectives, and learning styles critically engage with the topic or keyword. The topic editors and co-editors will make their selection by December 15, with full objects due by January 30.
- *Peer review*: Peer reviews of teaching and learning objects and keyword introductions due October 31.
- *Editing*: Topic editors and contributors have one month to respond to peer review.
- *Translation*: Students begin translation of keyword introductions and teaching and learning objects on November 30.
- *Introduction*: Project director writes introduction to publication, due December 15.
- *Platform development*: Perry typesets and uploads teaching and learning objects to Kilthub and introductions to POEM website beginning November 15, to be completed by February 28.

January 2026–March 2026

- *Content:* Teaching and learning objects from second call due January 30.

- *Pre and post assessment:* The co-editors design two simple pre- and post-assessment exercises, one to help users of POEM ascertain progress towards achieving critical understanding of each topic covered, and the other to help them ascertain progress towards overall literacy in a given area.
- *Translation*: Students complete all translations from first call, including all introductions and pre-and-post assessment exercises, by March 1.
- *Translation review:* Translations are checked in the first two weeks of March.
- *Accessibility review*: An accessibility consultant reviews website and content in early March.
- *Platform*: Perry adds translations of teaching and learning objects to Kilthub and of introductions to POEM website in late March.
- *Peer review:* By mid-February, co-editors assign teaching and learning objectives from September call to topic editors for peer review. These are due on March 15.
- *Editing*: Topic editors and contributors have one month to respond to peer review of second batch of teaching and learning objectives.
- *POEM* launches with first batch of teaching and learning materials on March 23.
- *Outreach*: Project director, co-editors, and keyword editors send announcement of publication to target communities. Project director presents project at SXSW EDU.

April 2026–July 2026

- *Translation*: Students begin translation of second batch of teaching and learning objects in early April and complete translation by late May.
- *Translation review:* Translations are checked in the first two weeks of June.
- *Platform*: Perry typesets and adds second batch of teaching and learning objects to Kilthub by early June.
- *Accessibility review:* An accessibility consultant reviews new content by June 10.
- *Platform*: Perry typesets and adds second batch of translations to Kilthub in time for the ALA conference in late June.
- *Outreach:* Project director and co-editors present first edition online (webinar series with roundtable discussion between editors and topic editors) and at library and education conferences (such as ALA, SxSW EDU, Digital Pedagogy Institute Online, American Association of School Librarians, UNESCO Global Media and Information Literacy Week). Announcement of publication published on community listservs, CMU Libraries website, and on social media channels.

Diversity Plan

The creation and publication of POEM will have diversity, equity, inclusion, and accessibility at its core. In many ways, the degree of literacy it aims to enable its users to achieve is one that will empower them to call out the systemic injustices (racism, sexism, ableism, Western-centric cultural biases) that, as scholars such as Joy Buolamwini,[33] Deborah Raji,[34]

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[33] Buolamwini, Joy. Unmasking AI: My Mission to Protect What Is Human in a World of Machines. Random House, 2023.
[34] Raji, Deborah. "How Our Data Encodes Systematic Racism." MIT Technology Review, 10 Dec. 2020, https://www.technologyreview.com/2020/12/10/1013617/racism-data-science-artificial-intelligence-ai-opinion/.

Wendy H. Wong,[35] Timnit Gebru,[36] Safiyah Noble[37] and others have shown, underpin algorithmic and data-driven decision-making and have devastating real-world effects.

POEM's large editorial team will be deliberately and intentionally inclusive and diverse diverse: the call for co-editors and topic editors will go out to community college, public, and high school libraries as well as college and research libraries via American Association of School Librarians, the Young Adult Library Services Association, and the Association of College and research Libraries as well as the American Indian Library Association, the Asian/Pacific American Librarians Association, the Black Caucus of the ALA, the Chinese American Librarians Association, and REFORMA to ensure that these perspectives are included in defining the project's keywords and content. Content creators will similarly be recruited to ensure the representation of a diverse range of authorial voices, examples, and perspectives. The centrality of DEIA is necessary in order that its target high school, community college, and college librarian and educator users see themselves and their student populations not only in the exercises and examples but in the roster of authors and editors who have shaped the work.

POEM's iterative, reflective, and community-led design process, whereby the entire editorial team, who will themselves be representative of those target users, will have intentional opportunities to engage with the design process, is premised on the tenets of Design Justice. In the building of the POEM web interface, the creation of tagging and filtering systems and other elements of UX and UI, and the selection of content, the voices of those who will most directly impacted by POEM's outcomes will be centered and their contributions welcomed, and the process itself will be, as the Design Justice Network's principles recommend, "accountable, accessible, and collaborative."[38] Project Director Nicky Agate will attend a two-week Design Justice workshop in July 2024,[39] before the POEM grant period begins, to learn about best practices in community-led, inclusive design.

Another aspect of POEM's focus on diversity is its attention to accessibility: the POEM web interface and all its content will be compliant with Web Content Accessibility Guidelines 2.1 AA standards[40] and a budget has been set aside for the creation of accessibility checklists for content creators and two rounds of accessibility review.

As an open-access, remixable, openly licensed and iterative publication, POEM can be translated into other languages, enriched with other examples, and enhanced and updated through integration with other open materials.

Project Results

POEM is an intervention. It will engage in increasingly complex information landscape to help high school students, college students, and their instructors and librarians, as well as interested members of the public, gain a deeper and critical understanding of the ways data and computation, algorithms and AI, and media and dis/information, are produced, deployed, and used in everyday life.

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[35] Wong, Wendy H. We, the Data: Human Rights in the Digital Age. The MIT Press, 2023.
[36] Bender, Emily M., et al. "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? 🦜." Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, Association for Computing Machinery, 2021, pp. 610–23, doi.org/10.1145/3442188.3445922.
[37] Noble, Safiya. Algorithms of Oppression: How Search Engines Reinforce Racism. NYU Press, 2018.
[38] https://designjustice.org/read-the-principles
[39] https://criticalai.org/designjustice/about/
[40] https://www.w3.org/WAI/WCAG22/quickref/?versions=2.1

Because POEM will have both bilingual content and a bilingual interface, it will be accessible to the almost 42 million Spanish speakers in the U.S. who make up over 61% of the speakers of languages other than English in American homes,[41] and will therefore have a broader reach than many existing English-language-only resources. And because of its status as an open educational resource that grants its users the "five Rs" (the right to reuse, retain, revise, remix, and redistribute), its content can also be translated into other commonly spoken languages in the US—Chinese, Tagalog, Vietnamese, and Arabic—without any need to negotiate foreign-language rights.
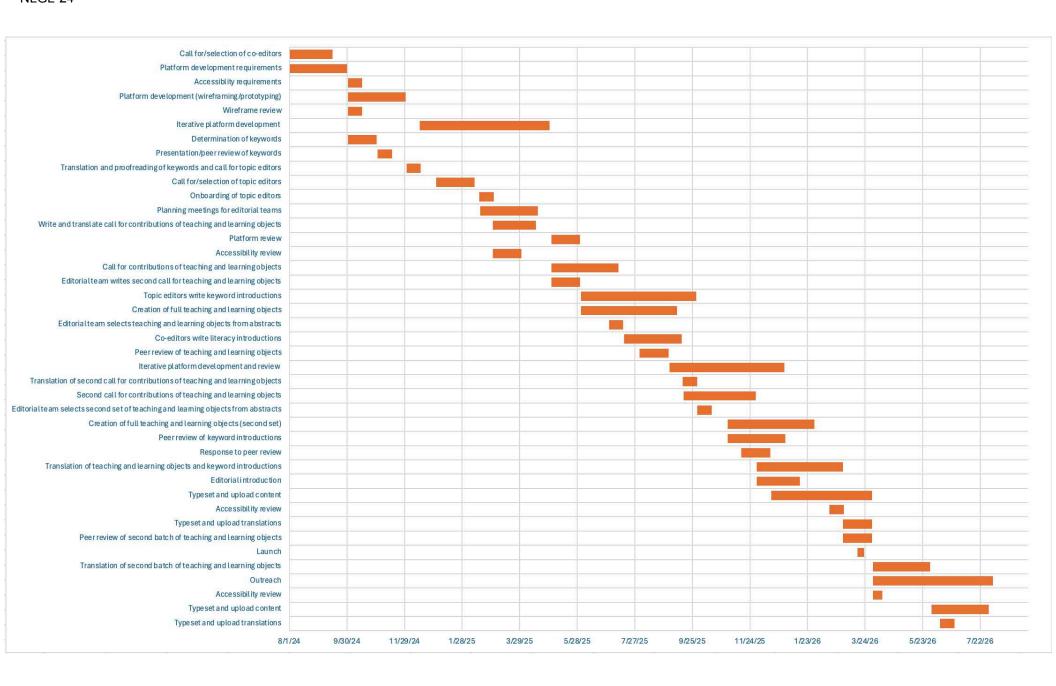
An insistence on meeting the requirements of those five Rs also mean that the materials will be openly licensed (with a CC-BY Creative Commons license) in a way that enables their adaptation, remixing, and reuse in course curricula, workshop activities, syllabi, and other learning opportunities. What is more, the structure of POEM itself, with its richly tagged content, will allow users to adapt those teaching and learning objects or keywords that are the most useful and meaningful to them.

In order to remain relevant after period of grant performance, the resources in POEM may need to be updated or amended. Because they will be deposited in Carnegie Mellon University's institutional repository, Kilthub, and then embedded into the web interface, it will be relatively trivial for the CMU team to edit embed codes to ensure the most recent resource is made available via the POEM website. And since Kilthub mints versionable digital object identifiers (DOIs), contributors and editors will be able to track the use of different versions resources at the item level.

The input and involvement of the project's large and diverse editorial team will help ensure that the content is readily adaptable and usable by a range of institutions across the U.S. POEM's topic and co-editors and its contributors are also its audience, made up of community college and high school librarians and faculty, as well as college and university librarians: they will not only create, describe, and tag the content, but will also peer review both it and the website itself, providing early and iterative feedback and feed*forward* on the project design. Furthermore, this expansive network of almost forty co-editors and topic editors, will be able to make use of their own professional networks to build engagement with and use of the resource.

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[41] https://www.census.gov/library/stories/2022/12/languages-we-speak-in-united-states.html

Schedule of Completion
POEM
NLGL-24

Task	Timeline
Call for/selection of co-editors	
Platform development requirements	
Accessiblity requirements	
Platform development (wireframing/prototyping)	
Wireframe review	
Iterative platform development	
Determination of keywords	
Presentation/peer review of keywords	
Translation and proofreading of keywords and call for topic editors	
Call for/selection of topic editors	
Onboarding of topic editors	
Planning meetings for editorial teams	
Write and translate call for contributions of teaching and learning objects	
Platform review	
Accessibility review	
Call for contributions of teaching and learning objects	
Editorial team writes second call for teaching and learning objects	
Topic editors write keyword introductions	
Creation of full teaching and learning objects	
Editorial team selects teaching and learning objects from abstracts	
Co-editors write literacy introductions	
Peer review of teaching and learning objects	
Iterative platform development and review	
Translation of second call for contributions of teaching and learning objects	
Second call for contributions of teaching and learning objects	
Editorial team selects second set of teaching and learning objects from abstracts	
Creation of full teaching and learning objects (second set)	
Peer review of keyword introductions	
Response to peer review	
Translation of teaching and learning objects and keyword introductions	
Editorial introduction	
Typeset and upload content	
Accessibility review	
Typeset and upload translations	
Peer review of second batch of teaching and learning objects	
Launch	
Translation of second batch of teaching and learning objects	
Outreach	
Accessibility review	
Typeset and upload content	
Typeset and upload translations	

Timeline axis: 8/1/24, 9/30/24, 11/29/24, 1/28/25, 3/29/25, 5/28/25, 7/27/25, 9/25/25, 11/24/25, 1/23/26, 3/24/26, 5/23/26, 7/22/26

DIGITAL PRODUCTS PLAN

Type
The Project on Open and Evolving Metaliteracies will produce born-digital content created by individuals and the project team. Digital products will fall into four categories: 1. Software; 2. Open educational resources (OER); 3. Metadata.

1. Software will include a WordPress-based website built using WP Gutenberg, React and WPGraphql. These were the elements used to build *Digital Pedagogy in the Humanities*, the project whose structure will be the basis for POEM. The Project Director is a former employee of the Modern Language Association, the publishers of *Digital Pedagogy in the Humanities*, and the MLA development team have agreed to share lessons learned with the POEM team.

- WordPress is a robust, widely used, and flexible open-source content management system that will serve as the backend for POEM. The CMU development team and the CMU co-editors are all familiar with WordPress development and use, making it a sustainable option for POEM.
- WP Gutenberg is a core editorial feature of WordPress, which reduces the need to rely on compatibility with or maintenance of third-party plugins. It allows for the design of templates for posts and pages, meaning that POEM's content will be consistent from a visual and a UX perspective. It also has dedicated blocks for embedding content from other sources: POEM will use this feature to embed teaching and learning objects deposited in Kilthub into the website.
- React, an open-source JavaScript framework, will be used for the frontend of Digital Pedagogy in the Humanities, ostensibly working with WordPress as a "headless CMS."
- WPGraphql is a free, open-source WordPress plugin that provides a specification for a Query Language for interacting with API data as a data graph. It allows WordPress posts (each teaching and learning object will be embedded in a post) to be quickly queried and filtered and then returned to the user. In POEM, it will enable users to select an audience-based tag such as "high school," a subject-based tag such as "bias" or a time-based tag such as "30 minutes" and then view all teaching and learning objects with that tag. It will also allow all teaching and learning objects tagged with a given POEM keyword to be displayed together.

2. Open educational resources (OER): POEM will publish some 300 assets in the form of open educational resources ("teaching and learning objects" in the Narrative), including but not limited to: evaluation protocols, activities, teacher resources, syllabi, curricula, and exercises. They may take any of the following forms: code, notebooks, maps, charts, drawings, text, audio files, images, and video files; the number of each cannot be ascertained at this time. Contributors will be required to submit teaching and learning objects to POEM in the "preferred" formats for digital preservation recommended by the Library of Congress.[1]

3. Metadata: The teaching and learning objects in POEM will all be deposited in Kilthub, CMU's institutional repository, and embedded in posts on the POEM website. Kilthub, which is powered by Figshare, provides metadata that is based on and compliant with the DataCite schema. Additional metadata will be added to both the WordPress site (in the form of tags and categories that will allow users to navigate between objects) and the Kilthub record. These tags will be determined through the design process, but are likely to include audience, subject, time required, language, and assigned POEM keyword.

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[1] https://www.loc.gov/preservation/resources/rfs/TOC.html

Availability
1. All software is open source and the code for POEM will be made publicly available via CMU Libraries' GitHub repository.
2. A stable version of each OER will be published on Kilthub, CMU's open-access repository. These will be accessible and downloadable via Kilthub and via the POEM website, where they will be embedded.
3. All item metadata will be openly published on Kilthub, CMU's open-access repository. It will also be accessible via OAI-PMH and retrievable mapped to various schema, including DataCite, Dublin Core, and RDF. A subset of the metadata will also be published on the WordPress POEM website.

Access
1. The code underlying POEM will be openly shared in GitHub via MIT License.
2. All open educational resources developed through this grant will be made freely available and downloadable via Kilthub and the POEM website and shared under the Creative Commons license CC-BY 4.0, which allows for the 5Rs of OERs (the right to reuse, retain, revise, remix, and redistribute). The Kilthub interface already complies with WCAG 2.1AA accessibility guidelines; the POEM platform and all teaching and learning objects will do so as well.
3. All metadata published on Kilthub are available free of restriction under the Creative Commons CC0 1.0 Universal Public Domain Dedication.

Sustainability

1. POEM software will be developed on a well-established, open-source platform (WordPress), in which the CMU team has shared expertise, and will be hosted for a period of by CMU Libraries. The code will be documented, stored, and openly published in GitHub, where it can be forked and augmented by other developers, including those at CMU. Technical project management will be documented in the Libraries' project management Airtable database. CMU Libraries is building out its existing publishing services and commits to maintaining this project as part of those services.
2. All teaching and learning materials developed as part of this project will be published and maintained on Kilthub, where they will receive a permanent identifier, and then embedded in the POEM website. While Kilthub accepts any file format, we will require contributors to submit objects in the "preferred" formats for digital preservation recommended by the Library of Congress. Kilthub content is monitored and preserved at the bit level and stored on Amazon AWS S3 infrastructure. Files and metadata are backed up nightly, and redundant copies are kept in multiple facilities. Each file is given an MD5 checksum when uploaded. File integrity is regularly checked against the checksum to make sure the file is intact.
3. Automatic backups of all metadata in Kilthub are performed nightly, directly to Figshare-managed Amazon Web Service (AWS) S3 buckets. AWS S3 versioning allows for the immediate restore of content in case of deletion of a file.