Librarians as Leaders of Open Educational Practice

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The "State of Open" in the School Library

Librarians in K-12 education are well-positioned to take on key leadership roles to address informational and instructional resource needs in their schools and communities. School librarians play many roles, but a primary duty in the twenty-first-century learning environment has been to build, maintain, and share a

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digital resource base for teaching and learning. As digital curators, K-12 librarians research, locate, and organize digital materials to support teaching and learning goals and foment student interest. They also ensure accessibility and effective use of those resources through local cataloging and classification strategies, as well as through collaborating and sharing with teachers and learners around those resources. When librarians successfully model and guide digital curation, they save teachers instructional time, open up possibilities for new pedagogical approaches, and help to build more independent, engaged learners.[1] Yet despite the value of their expertise, K-12 librarians are typically not included in the strategic planning and professional development discussions necessary to meet their districts' curriculum and instructional needs.[2,3]

Bolstered by national education initiatives such as #GoOpen, which has helped to raise awareness of open educational resources (OER), many school districts are looking to infuse their curricula with OER to meet the college-ready shifts and the deeper, personalized learning requirements embedded within their new learning standards—and are turning to their school librarians to support this effort. As digital education resources that are freely available, adaptable, and legal for redistribution, OER can be personalized to meet the individual learning needs of students. Further, the use of OER has been shown to foster collaborative practices that enable teachers to critique, contribute to, and improve educational content for others. [4–7]

Although OER provides more dynamic curricula and access to resources from a much wider variety of sources than traditional textbooks could, many educators, while aware of the existence and potential benefits of OER, find it difficult to effectively identify and use OER to meet local classroom needs.[8] Educators are, however, well-positioned to utilize OER: according to a recent national survey of eleven hundred math and ELA teachers, educators are utilizing materials they find or create themselves to a much greater extent than the proprietary materials offered by publishing companies.[9] This finding was echoed by a Harvard University study that surveyed teachers across five states and found that the majority of teachers are primarily relying on "homegrown" instructional materials to meet the Common Core State Standards, while a large percentage are also looking to free online platforms to find resources that meet the new standards.[10]

Education leaders and policymakers at both the state and national level, including the U.S. Department of Education's Office of Educational Technology, have pointed to school librarians as key potential players in digital and OER curation, and in professional learning relating to OER implementation.[11] OER enable school librarians the possibility of reinventing the school library as a nexus of free, ubiquitously accessible instructional resources. As public service information professionals, school librarians recognize that technology decisions

influence the ways in which their communities perceive the school library. Open practices through OER provide a pathway for school librarians as instructional leaders, enabling them to align their professional practice with the American Library Association's (ALA) Core Values of Librarianship, particularly the core values of access, lifelong learning, and professionalism.[12]

This chapter presents a research-based professional learning model and open educational practice rubric that supports the emergence of school librarians as instructional leaders in the curation and use of OER content. After discussing a case study that led to the codification of the model and the rubric, the chapter more fully explores the model's connection to the American Library Association Core Values of Librarianship.

Codifying a Model for School Librarian Leadership Practice

The School Librarian Leadership and Practice Rubric that is presented in this chapter was created as part of a collaborative partnership between the Institute for the Study of Knowledge Management in Education (ISKME) and Granite State College, with support from the Institute of Museum and Library Services (IMLS). The starting point for the effort was the recognition of the need to (1) equip all school librarians to be instructional leaders and, in particular, to advance learning in science, technology, engineering, and math (STEM) for student success nationwide, and (2) ensure that teachers understand how to tap the expertise of librarians on the use of curated OER for STEM teaching and learning.

The project's objectives began locally in New Hampshire with school librarians and their STEM teacher colleagues. For the first year, program leaders recruited a group of eighteen OER Fellows, to participate as members of mixed professional learning cohorts with one or two school librarians and up to three STEM teachers each. Working across STEM subject areas, the cohorts explored the effective use of open educational resources at a two-day Professional Learning Academy held face-to-face at Granite State College. The cohorts were also provided with continuous professional learning supports and online tools to guide them in building and teaching STEM lesson units that promote inquiry-based learning and literacy to increase students' STEM fluency.

The New Hampshire cohorts came into the project with knowledge of their own state science standards and were asked as part of the project to incorporate these standards into their co-design process. Additionally, they were asked to work in their cohorts to mutually interpret crosscutting concepts within the Next Generation Science Standards and the Common Core State Standards (CCSS) for literacy in science and technical subjects, and to apply them to their own classroom priorities.[13,14] This required cohorts to create a shared understanding of the standards

and to work toward effectively aligning and targeting their unit to address the core STEM standards that they identified. The aim was to enable the participating STEM teachers to more fully leverage the role of informational texts in exploring their subject area in deeper ways and to simultaneously increase their understanding of the role of the school librarian in addressing their subject area needs.

By bringing together the complementary approaches to inquiry that school librarians and STEM teachers had in common, the project sought to support the building of a new, trusted relationship between these two groups of educators around literacy-based inquiry. In appointing the school librarian as leader of the cohort and scaffolding the responsibilities of each role, cohorts were designed as a mechanism to build lasting partnerships that impact their teaching practice.

At the inception of the program, participating school librarians and STEM teachers indicated that they had not typically partnered on curriculum planning projects in their schools prior to joining in the cohort model. Some librarians reported that they had never collaborated with teachers in their STEM departments, underscoring that partnerships more commonly occurred across English language arts and the humanities. Furthermore, STEM teachers reported that at the start of the program they did not fully embrace literacy as a component of their lessons, and possessed limited knowledge of how to integrate primary sources, scientific datasets, or openly available content, outside of the textbook, into their curriculum.

To support cohort participants in these challenge areas, project leaders designed an inceptive guide for school librarian professional leadership and practice. The resultant "School Librarian Leadership and Practice Rubric" helps to codify, cultivate, and evaluate school librarians' instructional leadership capacities by articulating learning objectives and performance indicators in three mutually-supporting areas: Collaboration and Thought Partnership, Curriculum and Instruction, and OER and Open Educational Practice.

The three-part rubric, outlined in the section below, renders explicit the elements that are deemed necessary to school librarians as they work with STEM teachers to co-lead and promote high-quality STEM learning experiences that harness OER. Codifying the school librarian's central role as collaborative instructional leader, the rubric helps to ensure that teachers tap the expertise of librarians to engage OER for STEM teaching and learning, and to facilitate both sets of educators in modeling open educational practices as central to the transformative shift from a proprietary to a participatory education model.

School Librarian Leadership and Practice Rubric

The rubric below has been designed to guide practice in supporting and evaluating effective school librarian leadership development. The components of the rubric

are called leadership elements—the building blocks that are deemed necessary to support school librarians to co-lead and promote high-quality learning experiences and STEM learning experiences, in particular, that take advantage of openly accessible resources. Although the rubric was developed for STEM education specifically, it may be remixed or augmented to fit other subject areas as well.

The table below outlines the core elements of the rubric, and associated outcomes for School Librarians:

Leadership Element	Outcomes for School Librarians (SLs)
I. Collaboration and Thought Partnership	Design and facilitate collaboration and shared problem-solving practices with teachers and literacy. Advocate for the co-design of curriculum materials to support the STEM classroom across classrooms, the campus, and into the community.
II. Curriculum and Instruction	Articulate the rigor and relevance of the Common Core Science Literacy Standards and the crosscutting concepts of the applicable science literacy standards—including the concepts associated with national Next Generation Science Standards. Co-design curriculum with STEM teacher colleagues, and model the instructional shifts required for the integrated instruction of literacy and inquiry in the STEM classroom.
III. OER and Open Educational Practice	Build a library environment (physical, digital, experiential) that advances a school culture of open education practice and the use of open educational resources (OER) for collection building, curriculum design, and program development in the context of continuous improvement.

Collaboration and Thought Partnership

The first leadership element, Collaboration and Thought Partnership, supports school librarians in establishing successful co-design processes and communication pathways with their teacher colleagues, and in advocating for collaborative approaches to STEM teaching and learning. More specifically, this element of the rubric aims to support school librarians and STEM teachers in maximizing

their level of collaborative engagement to attain integrated instruction, a model in which the school librarian and the teachers share a vision, objectives, planning, and thinking. Collaborators bring complementary expertise—for example, on the identification of quality resources for instruction, on subject content, on knowledge of standards to be included in instruction, and on instructional strategies—to a process of shared creation. Below is an outline of the Collaboration and Thought Partnership element of librarian leadership.

In short, this element addresses the leadership skills necessary to foster dialogue between school librarians and their STEM teacher colleagues. School librarians demonstrate leadership by outlining a work plan and communication channels for educators to co-design learning experiences in their schools and by advocating for joint approaches that advance inquiry-based science literacy skills in the STEM classroom. In doing so, they contribute to the ongoing transformation of their profession—from school librarian to "teacher librarian" and instructional leader.

I. Collaboration and Thought Partnership
Design and facilitate collaboration and shared problem-solving

learning and literacy. Advocate for the co-design of curriculum materials to support the STEM classroom across classrooms, the campus, and into the community.

School Librarian (SL) Learning Objectives	School Librarian (SL) Performance Indicators
Collaborative Processes: SLs will understand their roles as collaborative thought partners and implement strategies for successful collaboration with STEM teacher colleagues.	collaboration and builds time-bound mechanisms and channels (face-to-face and online) for teacher–SL communication about student learning, STEM inquiry, and curriculum design, and initiates, and maintains dialogue using those channels.
Initiate Co-design Practices: SLs will be able to take the lead on and engage STEM teachers around co-visioning and co-designing for inquiry in the STEM classroom.	Recruits STEM teachers to participate in the collaborative design of learning experiences for students. Guides the collaborative design and implementation and SL roles, and how those roles can best work together to create and implement STEM lessons and learning experiences.

Advocate: SLs will be able to advocate to peers and within and beyond their school sites, and share insights and approaches to STEM teaching and learning.	Builds and implements an outreach plan that includes face-to-face and online communication with peers and the larger professional community to share and model SL-led teaching and learning approaches that advance inquiry-based reading and science literacy skills in the STEM classroom.

As collaborative partners, teachers advance the above learning objectives for school librarians through:

- working with school librarians to define collaboration roles, including which aspects of the lessons will be written and facilitated by the STEM teacher and which by the librarian;
- participating in conversations and regular meetings, and engaging around collaborative project ideas that are initiated by SLs and that meet the needs of the STEM classroom around inquiry and literacy; and
- sharing and advocating about their co-design efforts with their education community through multiple channels, including email, online discussions, newsletters, social media channels, and video.

Curriculum and Instruction

The second element, Curriculum and Instruction, enables school librarians to serve as effective instructional leaders, who are not only knowledgeable about their schools' curriculum and pedagogical practices but also take part in the creation and revision of those practices. The learning objectives and performance indicators for Curriculum and Instruction ensure that school librarians are able to articulate the role of inquiry-based literacy investigations in STEM curricula and how they contribute to attaining science literacy.

This element of the rubric further supports school librarians and teachers in interpreting and applying their relevant science standards, the crosscutting concepts of the NGSS, and CCSS literacy standards to their own classroom priorities. The aim is to facilitate a shared understanding of the standards toward effectively creating literacy-based inquiry experiences. Placing focus on literacy-based inquiry puts close reading of informational texts at the center of the STEM instructional unit or lesson—a focus that many STEM teachers may be unfamiliar with. Furthermore, school librarians and STEM teachers traditionally bring different approaches to student inquiry. While school librarians may work with an inquiry approach that guides students through the process of building and sharing

knowledge utilizing a range of information resources, STEM teachers may see inquiry as involving guided lab-based activities. The Curriculum and Instruction component of the rubric seeks to enable STEM teachers in their appreciation of the role of the text for exploring their subject area in deeper ways, and to increase their understanding of the role of the school librarian in addressing their subject area needs.

In building their leadership skills in Curriculum and Instruction, school librarians develop instructional strategies and co-lead the development of student learning experiences. They partner with STEM teachers to model the integration of inquiry-focused reading instruction to build student skills, such as the extraction of data and the production evidence from text sources while stimulating open inquiry in the STEM classroom. The element additionally emphasizes the development of the necessary professional discernment to identify resources that meet instructional and curricular goals, as school librarians become adept at selecting quality resources and add value by adapting appropriate elements within each resource or resource collection in alignment with identified learning goals.

Below is an outline of the Curriculum and Instruction element of the rubric.

II. Curriculum and Instruct

Articulate the rigor and relevance of the Common Core Science Literacy Standards and the crosscutting concepts of the applicable science literacy standards—including the concepts associated with national Next Generation Science Standards. Co-design curriculum with STEM teacher colleagues, and model the instructional shifts required for the integrated instruction of literacy and inquiry in the STEM classroom.

School Librarian (SL) Learning Objectives	School Librarian (SL) Performance Indicators
Understand and Articulate the Relevant Learning Standards and Instructional Shifts: SLs will be able to communicate the role of literacy investigations in STEM in attaining to the CCSS and NGSS toward increased student achievement.	Understands the (1) CCSS ELA Science Literacy Standards, (2) the CCSS instructional shifts, (3) applicable state NGSS crosscutting concepts, including (a) patterns, and (b) cause and effect.

Build Inquiry-oriented Text-Based Investigations: SLs will be able to develop strategies and co-lead the development of student tasks that build literacy skills called for in the CCSS Science Literacy Standards.	Partners with STEM teacher to lead in the development of STEM curriculum with a focus on text-based investigations. Includes: developing essential questions, building an informational text set for student close reading, creating text-dependent questions and designing student tasks focusing on students' ability to articulate text-based evidence and data in a STEM investigation, and synthesizing or presenting arguments to
Co-Teach Inquiry-Focused Reading as a Means of Investigation: SLs will be able to model instructional strategies to guide inquiry-focused reading for building content knowledge and science literacy.	Models the integration of inquiry-focused reading instruction to build content knowledge and literacy skills in the STEM classroom, the library, and across the school. Includes modeling teaching of the structure of text, determining the accuracy and relevancy of information sources, guided reading through text-dependent questioning, student engagement with academic vocabulary, and the extraction of data and the production evidence from text sources.

As collaborative partners, teachers advance the above learning objectives for school librarians through:

- identifying which science standards and units are appropriate for learning through literacy lessons;
- breaking a science standard into individual student objectives to be covered over several lessons;
- providing insight into reading levels, emotional needs, grouping strategies and other needs of the students in their classes;
- accessing other specialists (Exceptional Student Case Managers, English as Second Language Teachers, etc.) to provide assistance for diverse learners;
- co-creating the lessons with the school librarian;
- co-planning and co-teaching the lessons with the school librarian; and
- sharing experiences and offering feedback to their co-design partners on their lessons and approaches.

OER and Open Educational Practice

Embracing both the first and second elements, the third element, Open Educational Practice, integrates collaboration skills and curriculum and instruction expertise with the skills required for the advocacy and use of open educational resources. This element articulates specific competencies in instructional leadership as acquired through the curation and collaborative use of OER. The performance indicators for this element require that participants demonstrate an understanding of the role of OER in contributing to curriculum improvement and advancing instructional goals. Intended to provide precise guidelines to aid school librarians in aligning OER to students' particular needs, this element hones their expertise in curating and organizing exemplary, standards-aligned OER, accessing and applying open licenses, and leading the collaborative design and creation of high-quality OER.

This rubric element further defines a set of practices that help school librarians to advance a classroom and school culture of open education and to advocate for the potential benefits of open educational resources (OER) in the context of continuous improvement. The table below presents the OER and Open Educational Practice element of the rubric.

III. OER and Open Educational Practice Build a library environment (physical, digital, experiential) that advances a school culture of open educational practice, and advocate	
Understand the Uses SLs understand and can articulate the role of OER for curriculum improvement, and the impact of OER on teaching and learning.	Develops expertise in different use cases for OER and the importance of the shift to an open digital model on their campus. of open educational practice and OER with peers as a vehicle for continuous instructional improvement.
Find and Curate OER: SLs can discover and organize quality OER for teaching and learning on their campus.	Uses search and curation tools to discover OER, and to identify and organize OER to support the school's curriculum and student learning needs. Evaluates OER against local and established quality criteria for inclusion to enable discovery of OER by others.

Build OER Curriculum: SLs can lead in the role of creating or adapting OER for integration into their curriculum.	Uses digital content creation tools to author or remix OER (e.g., Open Author). Co-creates OER with STEM teacher colleagues to meet local teaching and learning instructional design and guiding others to do so and in integrating OER into other curriculum materials for instruction.
Evaluate and Align OER: SLs can evaluate OER in alignment with local or established quality criteria.	Applies CCSS literacy standards and relevant science standards to new and existing OER content to support usability of the resources. Demonstrates skill in using digital tools and rubrics to align existing OER to learning standards, accessibility requirements, and other local needs. Addresses alignment and/or crosswalk as part of OER development strategies.
Assess and Apply Open Licenses: SLs can apply the correct use of open licenses when selecting, using, or authoring resources.	Understands copyright and use permissions and open licensing differences. Understands the role of use permissions in enabling OER use and reuse. Selects appropriate open licenses to apply to works that they author or remix. Demonstrates knowledge around open licensing protocols and policies to be adopted at individual or institutional levels.
Share and Collaborate on OER: SLs can contribute to local, state, national, or global "commons" of shared OER, and understand their roles as collaborative thought partners in OER creation and use.	Publishes OER individually. Uses digital tools (e.g., ratings, commenting and discussion features) to share feedback to others on OER. Collaborates on OER creation with peers and students. Participates in online OER communities and networks that focus on continuous improvement of OER (e.g., OER Commons).

Advocate for OER and Open Educational Practice: SLs are able to advocate to peers within and beyond their campuses, and share OER-based approaches to teaching and learning.	Leverages social media networks and other advocacy strategies, such as the creation and sharing of articles, blogs, and videos to targeted audiences. Participates in outreach activities across the campus or region, including conference presentations and workshops in the wider education community. Encourages and supports new OER champions on their campus.

Finally, teachers advance the above learning objectives for school librarians through:

- understanding the defining principles of OER and demonstrating collaborative use of OER Commons digital library and toolset to discover and organize resources for sharing with others;
- co-authoring and co-publishing open content for others to use and reuse; and
- advocating for the potential benefits of open education practice and OER in terms of continuous instructional improvement with the school, district, and the wider educational community through online discussions, newsletters, social media channels, and video.

Applying the Rubric: Example of a Cohort Team Project

In the aforementioned project that was led by ISKME and Granite State College, cohort participants from New Hampshire were required to create literacy-based inquiry lessons aligned to the CCSS and relevant science standards, and to ensure the appropriate Creative Commons licenses and permissions for the adaptations and re-use of the lessons. In the process, they practiced skills in using digital content remixing tools and in building fluency in the concepts and practices associated with OER authorship and adaptation.

Iterative processes built into the professional learning program required cohorts to follow through with improving their STEM lesson units after classroom implementation by creating new versions in response to feedback from their peers. Some cohorts remixed their work to include examples of student work or supplementary materials that would assist future educators in adapting, customizing, and reusing the lesson units.

In addition, participants were also required to advocate for the OER they created and the open educational practices involved within both their school and

the wider education community. As part of this process, participants reflected individually on their cohort's collaborative teamwork and shared their reflections on the potential benefits of OER as a vehicle for continuous instructional improvement. Through departmental meetings, conference presentations, newsletter articles, blog posts, and other social media channels, cohort participants demonstrated increased confidence in their professional visibility and voice as leaders engaged in identifying sources of high-quality OER to advance student learning, energize school curricula, and promote schoolwide cultures of inquiry. In sum, evidence of instructional leadership among the New Hampshire cohort was shown in terms of the design and implementation of STEM inquiry lessons as reusable, adaptable OER, and the sharing of those materials to inspire the practices of a wider set of stakeholders.

One instructional unit in particular, titled "Power Grid," serves to illustrate the ways in which cohort teams were able to fuse complementary strengths to produce standards-aligned instructional resources for STEM inquiry. Power Grid was developed by a New Hampshire School Library Media Specialist with two high school science teachers. The unit was designed to be taught as a way for physics students to learn about energy and how much goes into charging their phones. It culminates with small groups of students presenting their plans for the ideal power grid for the state of New Hampshire.

As a unit, Power Grid addresses a complex Common Core science literacy standard that requires students to gather and analyze information to clarify issues, identify costs and benefits from a social, cultural, or environmental perspective, predict the consequences of action or inaction, and propose possible solutions. The teaching team noted that the unit was able to successfully engage their students by integrating multiple topics into a cohesive lesson—from fuel sources for energy production to pipelines, the idea of a smart grid. The lesson proved relevant not only locally, in terms of systemic awareness of infrastructure, but also occupationally, as the students participated in a field trip to a natural gas power plant where the plant manager talked to them about career preparation for a future in energy production.

Outreach and advocacy related to the above project included social media and school website postings to argue that teacher collaboration and integration of text-based, hands-on literacy skills lead to a deeper understanding for students, as well as the creation of infographics to educate stakeholders about the steps involved in developing an inquiry-based unit.

Early Evidence of the Success of the Model

On the whole, evaluative feedback from New Hampshire cohort participants indicates that the professional learning program to support Open Educational

Practice positively impacted their professional roles and perceptions of their roles. Evaluation data collected directly from school librarian participants at the end of their participation in the project indicated that programmatic support for collaboration and thought partnership translated into an increased understanding of how librarians and teachers can effectively collaborate in creating curriculum materials.

Similarly, programmatic support for developing competencies in literacy-based curriculum and instruction translated into increased confidence among librarians as instructional leaders and teaching partners. Participants noted the program helped them to develop strategies for building the range of student knowledge and skills called for in their state learning standards, recognizing in particular the need to incorporate and strengthen literacy skills as an integral part of STEM curricula. Furthermore, by articulating the skills involved in authoring, evaluating, and sharing original or remixed resources, the model builds competencies for creating educator networks that can continuously improve resources to better meet classroom needs.

Project participants indicated challenges to expanding the role of librarians in schools, including a lack of common planning time with teachers, and traditional perspectives about the role of school librarians that hinder partnerships with teachers in the design and implementation of learning resources. Such challenges call forth the need to involve school leadership in endorsing and supporting ongoing collaborations across instructional roles and to recognize the importance of team planning and implementation to student learning. In this regard, the project helps to demonstrate that a top-down, systemic adoption of open practices and OER in districts and states can provide opportunities for collaborative curriculum planning and improvement that opens the door to innovation and deeper learning for all teachers and students.

Integrating Open Practice and Core Values of Librarianship

As public service information professionals, school librarians recognize that technology decisions inevitably influence the ways in which students, teachers, and staff perceive the school library and the possibilities afforded by its information resources. In the face of continuous technological and societal change, school librarians rely on American Library Association's (ALA) Core Values of Librarianship as sources of stability and flexibility to guide technology decisions and to infuse their leadership with professional integrity. As discussed below, open practices through OER can serve to empower school librarians to align their professional practice with those core values, particularly the core values of Access, Lifelong Learning, and Professionalism.

Enabling access through OER

Because open technologies eliminate proprietary barriers to access, they contribute to the creation of equitable school library environments that cultivate local connections to a global information landscape, embodying the ALA core value of access.[15]

The value of access is at the root of a global movement to embrace open technology options to make high-quality educational resources accessible to all. In the US, through the federal #GoOpen initiative, twenty states across the country and more than one hundred districts have committed their support for the use of openly licensed educational resources to improve access to standards-aligned materials, and to enhance student learning through the provision of adaptable content that can be personalized to meet diverse student needs and learning styles. There are similar initiatives worldwide.

The use of OER enables teachers and students to enjoy free, unrestricted access to resources and curriculum collections featuring the most up-to-date and relevant content. This access means that educators are able to discover and fill gaps in content (e.g., science inquiry tasks), to integrate new digital materials into their curriculum (e.g., interactive games, simulations), to incorporate innovative teaching and learning strategies (e.g., kinesthetic learning or design thinking), and to increase relevance, with reference to current events and topics (e.g., local climate change issues).

As the demand for access to high-quality, relevant learning materials increases, additional incentives for collaborative development and sharing of adaptable resources are likely to emerge. For example, if teachers in Hawaii find a resource they like from an example in New York that focuses on the subway system, they are able to localize it to make it culturally accessible and relevant to Hawaiian norms and the learning needs of their students.

Enabling education and lifelong learning through OER

By building new skills and capacities as instructional partners and thought leaders around OER, school librarians ignite and sustain lifelong learning through the practices associated with OER. The ALA's core value of education and lifelong learning finds expression in the inclusive, participatory, transformative processes of OER adaptation, creation, and sharing.[16] As instructional leaders capable of using OER to stimulate interdisciplinary inquiry, knowledge sharing, and continuous innovation, school librarians are well-positioned to develop repertoires of instructional resources and strategies to advance learning within and beyond school communities.

Empowering professionalism through OER

By equipping school librarians to provide instructional leadership as part of the transition toward library services that meet their school's increasingly digital and dynamic curriculum requirements, open educational practices serve to empower librarianship professionalism. The use of OER and associated peer review and co-design practices encourage school librarians to adopt skills and behaviors that allow them to reflect critically on their own and their peers' professional practices and to make informed changes as instructional leaders. This is directly in line with the ALA core value of professionalism in which librarians are required to "strive for excellence in the profession by maintaining and enhancing our own knowledge and skills, by encouraging the professional development of co-workers, and by fostering the aspirations of potential members of the profession."[17]

Conclusions: Implications for OER and the School Librarian

The School Librarian Leadership and Practice rubric grew out of a three-year project to support school librarians in their roles as instructional leaders. The rubric comprises a skill set in collaboration, curation, curricular design, leadership, and advocacy. The rubric articulates specific competencies in instructional leadership and practice as acquired through the ongoing curation, adaptation, and collaborative use of OER. The performance indicators listed within the rubric require that school librarians demonstrate an understanding of the role of OER in contributing to curriculum improvement and advancing instructional goals.

The aim of the rubric is to build the capacity of school librarians to collaborate on OER for STEM learning, recognizing that there is a global need to equip school librarians to be part of instructional leadership through OER. The aim is also to support education leaders and administrators in enabling a transformative shift from a proprietary to an open and participatory model of educational practice. The rubric was developed for STEM teaching and learning; however, as an open educational resource itself, the rubric may be adapted to help stakeholders across all subject areas to enhance their practice moving forward, as well as to enable the assessment of current practice to ensure continuous learning in the field.

Working with educator cohorts in New Hampshire to address the development of concrete skills for school librarian leadership and practice has revealed the importance of a clearly articulated set of performance expectations on how librarians and teachers can effectively collaborate in creating curriculum materials. The work also unveiled challenges to expanding the role of librarians in schools, including a lack of common planning time with teachers, and traditional perspectives about the role of school librarians that hinder partnerships with

teachers in the design and implementation of learning resources. Given the growing demand for equitable access to high-quality, flexible digital content that meets diverse student learning needs, understanding the role of school librarians around OER curation and curriculum development and how to best model and support their efforts has never been more urgently needed.

Notes

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13. The Next Generation Science Standards (NGSS) are national K-12 science standards that seek to

support students in mastering real-world science literacy. The NGSS outline seven *crosscutting* concepts that help students explore connections across all domains of science and engineering, in order to develop a coherent and scientifically-based view of the world. The cross cutting concepts include, for example, that students understand cause and effect, that they are able to recognize patterns, and that they understand scale, among other concepts. See http://www.nextgenscience.org/.

14. The Common Core State Standards for English Language Arts & Literacy are national K-12 learning standards that seek to help students master the challenges of reading, writing, speaking, listening, and language across subjects. The Common Core literacy standards in Science and Technical Subjects specifically address several core skills and knowledge areas, including analyzing texts and citing evidence from the text, and comparing and contrasting information gained from science experiments, among other skills. See http://www.corestandards.org/ ELA-Literacy/.

15. American Library Association (ALA), "ALA Policy Manual Section B: Positions and Public Policy Statements," http://www.ala.org/aboutala/sites/ala.org.aboutala/files/content/governance/policymanual/Links/cd_10_2_Section%20B%20New%20Policy%20Manual-1%20%28final%20 4-11-13%20with%20TOC%29.pdf.

16. Ibid.

17. Ibid., 6.

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