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# Research Performance Support: Connecting Online Graduate Students from the LMS to the Library

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# Research Performance Support:

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**Abstract**

Universities expand their online graduate programs daily, which challenges academic librarians to maintain research support and information literacy instruction for the growing number of online students. Performance support offers a scalable solution to the problems of limited time and staffing that academic librarians face. When embedded in the learning management system throughout a course or program, performance support provides point of need research help and scaffolds students' information literacy development. Librarians are able to focus their limited time helping students with their more advanced research needs.

KEYWORDS: performance support, point of need, library instruction, librarian teacher cooperation, integrated learning systems, LMS, online education, information literacy, graduate students, academic achievement

## Introduction

Providing information literacy instruction for online courses presents varied challenges for academic librarians. Students are often not on campus, eliminating the possibility of face-to-face interactions in classroom sessions or one-on-one consultations. Without the physical library as a focal point of campus living, online students can have difficulty finding the library online

and can struggle navigating the library website effectively. Students can be located in different time zones and are often juggling work and family making it difficult to hold synchronous instruction online. Embedded librarianship is near impossible in courses that are able to enroll hundreds or thousands of students without the constraints of the physical classroom.

As both distance and on-campus students take online courses in great numbers, librarians need a versatile toolkit to provide a scalable solution to information literacy needs of online students. While essential, a library website, LibGuides, online tutorials, and virtual reference alone are not sufficient to meet the needs of online students. In addition to these vital library tools and services, resources also need to be placed at the exact moment of need in students' coursework. Research from corporate training points to the benefits of electronic performance support systems as point-of-need information support. The strategic placement of research performance support in the learning management system (LMS) can nurture student success and help librarians be more efficient. Additionally, performance support elevates the visibility of the library, its importance to academic conversations, and its role in academic success. This article highlights the specific information literacy needs of online learners, explains performance support and its benefits, and describes the preliminary efforts to implement research performance support at Concordia University in Portland, Oregon.

**Online students and the library**

Distance education programs are a popular choice for postsecondary studies. In the fall of 2013, 5,522,194 students were enrolled in postsecondary distance education courses (National Center for Education Statistics, 2014a). In the fall of 2012, 4.6 million undergraduate students took online courses, two million of these students took all of their classes online, and almost half of these students' online courses were from institutions in the students' home states (National

Center for Education Statistics, 2014b). At the graduate level, in fall 2012 867,000 students took online courses and 639,000 took all of their courses online (National Center for Education Statistics, 2014b). Those graduate students studying exclusively online represent twenty-two percent of all graduate students in the U.S. (2014b). Adults of all ages choose distance courses for their affordability, accessibility, and flexible scheduling. However, adults ages 30 and over choose distance education more frequently than younger students (National Center for Education Statistics, 2015), indicating that the ability to schedule coursework around work and/or family responsibilities is especially attractive to older students.

The online presence and accessibility of the library is crucial to students' research success. Librarians employ different tools and strategies to bring library instruction and research resources to online students. Embedded librarianship has been the most visible and engaged model for library instruction in online courses. In this approach, there are a range of ways librarians are directly engaged in online courses, from hosting discussion boards to teaching information literacy sessions online. Some deeply embedded librarians introduce content into online courses such as tutorials or quizzes and some are enrolled in courses but are only available to answer student questions via email or chat reference. Smaller colleges with fewer courses and lower enrollment have found success using embedded librarianship (Easter, Bailey, & Klages, 2014), but larger institutions have found that this model is not scalable or sustainable (Chisholm & Lamond, 2012).

On campus students receive just-in-time instruction in librarian-led classes and workshops timed to assignments and in one-on-one in-person research consultations. Online students deserve the same targeted and timely contact with the library. When it is not feasible to have a librarian embedded in every online course, information literacy and library resources can

be integrated in the curriculum as a gateway to the library and to contact with librarians. Researchers at the University of North Texas (UNT) asked their distance education students about their information literacy needs. Students indicated that they would rather have instruction "pushed" to them at the moment of need instead of having to seek out instruction (Wahl, Avery, & Henry, 2013). Timeliness and efficiency were top priorities mentioned in focus groups and students also asked for more prominent placement of library resources and content in the LMS (Wahl, Avery, & Henry, 2013).

Placement of library resources in the LMS is an important consideration. As Shank and Dewald (2003) stated in their early article about embedding in an LMS, "The closer the link between course assignments and library resources to help with those assignments, the greater likelihood that students will access library information" (p. 41). Point-of-need resources provide teachable moments whenever and wherever students are researching online. The opposite of this approach is to place links to library resources outside of an assignment or course, requiring students to search for answers and instruction. In their research with 1,800 postgraduate Education students, Massey University found that the placement of library instruction and the independent nature of online research were two of four necessities for the success of online point-of-need resources (Chisholm & Lamond, 2012, p. 227):

1. The library module was well-placed at the point of need,
2. The lecturer referred to it,
3. There was a real need for the students to independently find information, and
4. The online component of the course was of high importance to learning.

When instruction is not placed strategically at assignment level or the point of need, resources go unnoticed and unused. In a study from the University of Florida, the low usage of video tutorials

by online doctoral students was attributed to the placement of the tutorials; these resources were not placed directly in the curriculum at "strategic points" (Kumar & Ochoa, 2012, p. 74). Point-of-need resources embedded strategically in the curriculum can be a successful way to preventively answer more general, frequently asked questions, while at the same time providing librarians with more time to work in-depth with students requiring a one-on-one interaction. Due to its embedded and automated nature, strategically placed performance support can provide just-in-time support for online higher education students.

**Performance support defined**

Point-of-need information literacy resources provide instruction precisely at the moment of need so students gain knowledge and skills to seek, find, evaluate, and use information to successfully complete coursework. While borrowed from corporate environments, the field of performance support provides librarians with an intentional way to provide students in online courses with specific point-of-need instructional resources:

> Performance support is a tool or other resource, ranging from print to technology-supported, which provides just the right amount of task guidance, support, and productivity benefits to the user, precisely at the moment of need. Performance support makes work easier and makes people more productive at the moment of need. (Rosenberg, 2013, p. 1)

Performance support systems are intended to increase a novice user's ability to complete a defined task, such as locating the full text of an article, by providing instructional resources at the point the user needs them: "The rationale underlying the use of performance support is based on the fundamental belief that all aspects of human performance (both physical and cognitive) can be improved through the use of an appropriately designed performance intervention" (Barker,

van Schaik, & Famakinwa, 2007, p. 245). Performance supports are most frequently provided for simple, well-defined, procedural tasks (Wild, 1998). Many performance support systems have a two-fold aim to "train and support the novice user in the performance of tasks" (Wild, 2000, p. 6). The systems also are intended to provide users with the exact information needed to perform a task at exactly the moment they need to perform it (Cole, Fischer, & Saltzman, 1997). In this way, performance support stands apart from traditional instruction or training that happens before a user needs to perform a task.

Nguyen and Hanzel (2007) define three types of performance support: external, extrinsic, and intrinsic. External support requires users to disengage from their work, seek out and find necessary information, learn the support content, then return to their work. A library website that exists but is not included in an online course would be external support. Extrinsic support is linked to the work space but still requires users to leave their work to find and access needed information. A link to the library homepage in an online course would be extrinsic support. Intrinsic support is built directly into the work space (Nguyen & Hanzel, 2007) and does not require users to stop their task to seek out external supports to search for information. A link to information on how to find a digital object identifier placed with an assignment requiring an article reference in APA style would be intrinsic support. Linking to specific support is better than requiring searching. According to Rosenberg (2013), the best way to ensure that users can locate the performance support they need is to "integrate [the performance support] directly into the workflow" (p. 1). For this reason, intrinsic support is most efficient, especially for novice users.

**Benefits of performance support**

Performance support benefits both the organization and the user. For the organization, using performance support systems reduces the need for high-level investments in training and allows training to be easily adapted. Performance support can eliminate the need for in-person trainings (Cole, Fischer, & Saltman, 1997) which can be both costly and time consuming for organizations and corporations. Many performance support systems are built on collections of small, discrete learning modules. When necessary, individual modules can be updated without requiring the expense and time commitment required to update an integrated training program. Performance support systems allow organizations to provide needed information to users in a timely way that doesn't remove them from their work environment or the tasks at hand (Nguyen & Hanzel, 2007). All of these benefits lead to a more productive and efficient organization.

Efficiency also benefits users. Searching for information on how to do a task decreases efficiency in job performance. In some industries and organizations, an inefficient "hit-and-miss" approach to finding and accessing needed information is unacceptable, and workers in these environments are pushed to minimize the time it takes to integrate new information into job performance (Nguyen & Hanzel, 2007). Additionally, instruction given before the actual need occurs is not retained. When training is delivered too far in advance of task implementation, the information is often forgotten by the time it is needed (Nguyen & Hanzel, 2007).

Performance support can also be seen as a cognitive tool. Cognitive tools support learners through the thinking and doing of a task. According to Jonassen and Reeves (1996), "Cognitive tools refer to technologies, tangible or intangible, that enhance the cognitive powers of human beings during thinking, problem solving and learning. Written language, mathematical notation,

and most recently, the universal computer are examples of cognitive tools" (p. 693). As a cognitive tool, performance support systems can help users learn a task while completing it.

In a study of students learning the skill of lesson planning, Wild (2000) found that the repeated use of the support functions within the lesson plan helped students learn how to do the various tasks required by lesson planning and shortened the amount of time it took to do those tasks (Wild, 2000). Performance support assisted students in acquiring the knowledge they needed in order to accomplish the complex tasks required in planning a lesson (Wild, 2000). It provided students with the help they needed within an authentic learning experience, directly connecting the information with the information need, and these types of authentic learning situations are more likely to foster higher order learning (Wild, 2000). Wild's experience with performance support in lesson planning also suggests that students will learn skills through the support and be better able to apply them in the appropriate context in the future.

**Performance support and academic libraries**

Challenges of accessing, evaluating, and using information in the workplace are different from those in academia. For example, workers are less likely to have access to librarians and specialized databases (Monge & Frisicaro-Pawlowski, 2014). However, performance support benefits academic users in similar ways, and the need and desire for efficiency in workflows also applies to education and libraries. Performance support embedded in online curricula creates a point-of-need response for some information needs, supports task and assignment completion, and develops reusable knowledge and skills. It can also increase the efficiency of both users and librarians.

While performance support cannot replace all information literacy instruction, some foundational research skills do not always require an interaction with a librarian. In these

situations, performance support allows students to take charge of their learning in a do-it-yourself style. For example, if a student needs to search a specific subject database for an assignment, linking to the database in the assignment instructions saves the student the task of figuring out how to find an appropriate database. Library websites are becoming increasingly complex due to numerous connecting hyperlinks. This complicates the research process and discovery of information sources (Collard & Tempelman-Kluit, 2006). Linking to specific library webpages also benefits librarians' workflow by reducing the number of questions from students trying to figure out how to find a specific resource or page. Additionally, if the linked resource is a LibGuide or other page maintained by the library, updating the content of the performance support is possible independent of other faculty and staff such as course and instructional designers who control LMS content.

Video tutorials are another tool that become performance support when they are placed directly at the point-of-need in the online curriculum. For example, a video tutorial that concisely demonstrates how to filter search results for peer reviewed articles is an example of performance support when it is linked directly in an assignment requiring peer reviewed articles. Visual tutorials have been found to be good for basic task-based instruction (Kimok & Heller-Ross, 2008, p. 530). For some students a performance support tutorial allows a specific task to be accomplished independently. For example, a student who is struggling to find resources can view a video that demonstrates a successful search strategy in a search tool appropriate for their topic (Kimok & Heller-Ross, 2008).

For other students, performance support for basic tasks will not be enough and they will need to consult with a librarian. Similarly, information literacy is much broader and deeper than just basic research tasks, and some instruction needs to occur in a more in-depth format. In

addition, some online students will prefer to have all of their information literacy needs met by conversing with a librarian by phone, chat, or email. By creating scalable responses to some information literacy needs, implementing performance support allows librarians to reach hundreds or thousands of students with one tool while providing librarians time to build relationships with those students who need more direct or personalized mentoring to thrive academically. Relationship building is an important component of online students' success and many students enjoy receiving personal mentoring from faculty (Holzweiss, Joyner, Fuller, Henderson, & Young, 2014). Embedded performance support serves an additional purpose in relationship building. Links to library webpages, library discussion boards, or embedded videos created by the library acquaint students with the library and liaison librarians assigned to specific courses and departments. This visible point of contact can open the door to one-on-one discussions and consultations.

Librarians view research as a goal while students see it as one piece of a larger project (Collard & Tempelman-Kluit, 2006). Another reason for incorporating performance support is that the inclusion of targeted library resources and tools demonstrate to students that information literacy and research skills are integral to course success (Collard & Tempelman-Kluit, 2006). Conversely, understanding the student goal (being successful in class) can help librarians identify how research skills fit in the larger goal.

**Anticipating student needs and placing performance support**

Deciding what type of performance support to develop and where to place it requires an anticipation of student needs in the context of course outcomes and assignments and an understanding of students' views of research. The former can be informed by reviewing curricula, collaborating with course designers and faculty, and analyzing reference questions.

Collard's and Tempelman-Kluit's (2006) interpretation of Roger Schank's goal-based scenarios provides some guidance on the latter. Schank (1994) asked, "Why would anyone learn anything if not to help in the pursuit of a goal?" (p. 429). Additionally, there are a set of skills needed to achieve a goal (Schank, 1994). While students need to develop information literacy skills to complete research-based assignments, their goal is not to become information literate, but rather to complete (and succeed) in their assignment (Collard & Tempelman-Kluit, 2006).

> Indeed, Schank's model—where the 'links' that contribute to success of the goal are strung together into a meaningful whole—fits exceptionally well within the library context. . . . Delivering these library tools as a skill set needed within the larger course goals, then, can provide not only a practical implementation benefit, but also an educational one. (Collard & Tempelman-Kluit, 2006, p. 58)

Thinking about skills and student goals in this way allows librarians to better anticipate student needs so that performance support in the LMS is more targeted. This aligns with the goal of performance support to provide support and task guidance at the moment of need.

> …if we can structure and/or anticipate the route that a given user might take during the course of their work, we have a better chance of providing directed, relevant help. The goal-based structure gives you a smaller set of variables and higher confidence of users' action or needs at a given point in the process. This knowledge can then be translated into responses to likely problems and questions, and can help identify problem areas where users might encounter difficulty. (Collard & Tempelman-Kluit, 2006, p. 59)

**Performance support and the Framework for Information Literacy**

While it may at first seem easier to connect performance support to the skills-based view of information literacy that the ACRL standards emphasize, performance support can contribute

both to a set of skills (ACRL Standards) and to inquiry (ACRL Framework). This dual existence echoes the opinion of many in the field, which is that the Framework can coexist with the Standards instead of replacing them (Beilin, 2015; Exner, 2014; Fister, 2015). The broader discussion of why peer reviewed articles are favored in many academic disciplines is not overshadowed by performance support that assists students in filtering for peer reviewed results. Conversely, the importance of the discussion around information types and their different uses does not erase students' need to fulfill assignment requirements that demand peer reviewed articles.

Information literacy performance support can efficiently immerse the user into the world of information. Without targeted performance support, online students might easily be excluded from the library and consequently, the discourse occurring in certain information communities, for example, academic communities that converse by writing and reading scholarly publications. In other words, in an online course that does not build information literacy skills by connecting LMS users to libraries and research tools, most students will end up in Google, which only provides access to some communities of information, and limited access to academic communities. Imagine if a university located its library miles away from the college campus. If it is difficult to navigate or even find the library website or specific online research tools, we exclude online learners in the same way that a physically remote library would exclude on-campus users.

Barbara Fister (2015) stated, "You learn how information works by encountering, using, and creating it" (p. 16). Performance support can facilitate all of these experiences by moving online learners deeper and more quickly into their research process. Using performance support as one part of an overall information literacy instruction program allows librarians to focus

instruction on the big ideas of information literacy: critical thinking, questioning, conversation, evaluation, and exploration. The flexibility of the Framework also pairs well with performance support as the latter can be used to customize entry into any of the frames in different courses and disciplines. For example, the ways in which an undergraduate biology student might need to interact with the library and its resources can be vastly different than the needs of a creative writing graduate student. Their information communities are not the same and their inquiry processes will likely differ. Why shouldn't their entry into online library instruction and resources also be different and integrated into their curriculum so it is clear that the library is appropriate for both disciplines? If part of information literacy as defined by the Framework is moving students into discipline-specific information communities and nurturing their participation in, contributions to, and questioning of these communities (Foasberg, 2015), performance support will help to facilitate this.

Another way that performance support aligns with the Framework for Information Literacy is the collaborative curriculum design required to implement performance support in online courses. Librarians collaborate with faculty and/or instructional designers to include performance support in course content. In its most robust format, performance support embedded throughout a course or an entire degree program provides the scaffolding to nurture learners "from novice to expert in their understanding of the core information literacy concepts, knowledge practices, and dispositions through all stages of their academic careers and beyond" (Association of College and Research Libraries, n.d.).

**Research performance support at Concordia University Portland**

What could research performance support look like for online graduate students?

Over the past five years, librarians at Concordia University Portland have been gradually implementing performance support into online graduate courses. Faculty and administrators often incorrectly assume that graduate students are appropriately knowledgeable and skilled in research or that they will become so on their own initiative, causing information literacy instruction for graduate students to be overlooked (Rempel & Davidson, 2008). The truth is that in many graduate programs, students' information literacy, past research experience, and academic writing skills vary greatly. The majority of students at Concordia University, a private university in Portland, Oregon, are pursuing either a Master of Education (MEd.) or Doctorate of Education (EdD.) degree online. Currently, this equates to about 6,000 online graduate students enrolled in classes ranging in length from five to eight weeks.

For online students, the library provides electronic resources, virtual reference, subject-specific LibGuides, a searchable FAQ database, and varying forms of embedded librarianship. There is a library orientation module in the LMS but students are not required to review it. While reference services are provided by all librarians, two distance education librarians are dedicated to reference and instruction for graduate education students. In addition to the above mentioned tools and services, performance support was added to provide scalable instruction solutions to online graduate education students.

In M.Ed. and Ed.D courses, performance support is placed strategically in the LMS at the point-of-need. Wherever possible, emphasis is placed on assignment success and support aims to help students access library resources and complete information literacy tasks efficiently. By removing barriers to assignment success, performance support at this level develops transferable skills that can be used in future coursework or professional research. Determination of type and placement of performance support is made based on the following: examination of the

curriculum including outcomes and assignments from the view of a student, analysis of quantity and type of reference questions asked, and collaboration and consultation with course writers, instructional designers, and faculty teaching the courses. The short length of courses (five to eight weeks) is also considered.

Program-specific webpages provide a first layer of *extrinsic* support to online graduate students because students are linked to LibGuides instead of the library homepage when they click on "library" links from the LMS. The following are brief examples of currently placed *intrinsic* performance supports:

**Instruction on peer reviewed primary research articles**. Students complete their M.Ed. degree by completing a capstone project (a thesis, action research proposal, or practitioner inquiry project). Each capstone requires a literature review of peer reviewed primary research articles. In the research methods courses that introduce the literature review, the assignment instructions link to a specific LibGuide page for primary research articles. By clicking on the link in the assignment, students can then choose four subpages: what primary research articles are; how to find them; a video demonstration of how to search for them; and where to find them. In 2015 the main primary research articles page received more than 34,000 views. Instead of receiving questions such as, "What are primary research articles?" or "Where do I go to find articles?" in unmanageable quantities, librarians get fewer and more pointed questions such as, "I watched the video and read the instructions for primary research articles, but I'm having trouble finding enough articles on blended math classrooms." The subpage that explains how to find primary research articles received 10,306 views in 2015. A similar page called Search Tips that is linked in the discussion board instead of being included in the assignment received only 2,871

views. While it is possible that there are other reasons for the difference in page views between these two similar pages, it seems likely that the placement is a factor.

**Instruction on seminal sources.** Students who choose the thesis capstone option are additionally tasked with finding seminal sources on their topic. Before adding performance support to this area, students were frequently asking librarians what seminal sources were and how to find them. An FAQ was created in the library's searchable FAQ database to explain what seminal sources are and provide search strategies and links to appropriate search tools for finding seminal sources. The FAQ went live in July 2014 and then became performance support in the LMS at the end of September 2014. Viewing statistics confirmed that the placement in the LMS increased the usage of the FAQ and decreased reference questions. In the two months after the FAQ was created but before it was placed in the LMS, it received an average of 13 views per month and reference questions about seminal sources averaged 20 per month. In the two months after it was placed in the assignment in the LMS, it received an average of 112 views per month and reference questions about seminal sources averaged only two per month. From September 2014 to September 2016, the FAQ received an average of 104 views per month and reference questions pertaining to seminal sources average less than one a month.

**Instruction on finding peer reviewed articles.** To help students complete their first assignment that requires a peer reviewed article, a video tutorial was placed directly in the assignment instructions. The two-minute video was created by considering both adult learning theories and instructional design best practices. The video and its placement at the point-of-need in the curriculum has almost eliminated the question of what a peer reviewed article is and how to filter results for peer reviewed articles among students in this particular course.

## Conclusion

While libraries recognize the importance of student contact and welcome reference questions from students, not every question requires a one-on-one answer from a librarian. Further, research instruction gaps often exist in online curricula. When these are identified by reviewing course content from a student point-of-view or by analyzing reference questions, they can efficiently be addressed with preventative performance support strategically placed in the LMS. By filling these gaps with targeted webpages, videos, search tools, or other performance support, students complete assignments more efficiently and librarians preserve time for engaging more deeply with students requiring more specific research help and mentoring. In this way the library collaborates with students and recognizes their goals while increasing the visibility of the library and its important role in research and overall academic success.

Significant numbers of students are taking online courses, both those living far from campus and studying exclusively online and those taking online courses while on campus. While many libraries with online learners have implemented helpful and necessary ways for online students to interact with librarians (embedded librarianship, virtual reference, synchronous webinars), these pedagogies are insufficient in providing a scalable point-of-need response when courses or programs have hundreds or thousands of students enrolled. These tools alone are also unable to accommodate all students' schedules, especially those working full time, completing coursework late at night or on the weekend, or living in time zones opposite to those of the institution. Although performance support is not a traditional approach used in education, libraries can utilize performance support as one way to implement specific and specialized point-of-need responses to meet the unique information literacy needs and academic goals of online learners.

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