See Sally research: Evolving notions of information literacy

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Digital and ubiquitous sources of information, expanded definitions of literacy and audience, and greater emphasis on creative problem -solving have dramatically changed how - and why - students "do" research. The following scenarios scan the evolution of the information and communication landscapes, sharing the new possibilities for student research.

1989 (pre-Web)

Sally Madonna is a high school junior very interested in environmental issues. The learning emphasis at her high school is on "research skills" (the first edition of the American Association of School Librarians' (AASL's) *Information Power* was published in 1988; it defined the role of the school library in the school and school librarians still use it as an information literacy bible).

Development of question
When the opportunity arises to research a controversial issue, Sally eagerly proposes an investigation of the environmental impact of the recent Exxon Valdez oil spill. The assignment calls for simple reporting at Bloom's knowledge/comprehension level since the major learning outcome is knowing how to write a "term paper." Sally may not have had much choice in her topic, considering the general lack of available resources available in the average school or public library. Sally is asked to develop a "thesis" statement and to provide evidence that supports it.

Finding resources
With her Social Studies teacher, Sally visits the high school library. In the library, the class uses the wooden library catalog with its drawers and paper cards to locate books. She consults the *Readers' Guide to Periodical Literature* and the vertical file for magazines in the stacks and newspaper clippings. Additionally, the librarian suggests the microfiche and CD-ROM collections for finding magazine articles. While personal computers are coming into the schools through libraries and labs, electronic information sources are very much limited to reference materials like encyclopedias on CDs with content that is simply the electronic version of the print editions.

Sally's librarian created a bibliography of resources and pulled a cart of materials related to controversial issues, but Sally finds very little material that gives her more than background on

critical environment issues. The librarian offers a ten-minute introduction to possible sources. Because this is the first major environmental event of its type, Sally knows that books specific to this oil spill may not be available. The librarian can connect to a service called *Dialog* with a dial-up modem, but this is an expensive service that cannot really be scaled out for an entire school and most students haven't even connected yet to a specific topic or thesis. At the end of the period, the librarian reminds the class to grab a style sheet handout.

When she gets home, Sally asks Mom and Dad if she can have the car to visit the public library and searches the house for change for the copy machine.

At the public library, Sally fills in call slips and waits for help to retrieve recent issues of *Time* and *Newsweek* from stacks and background articles on microfilm. Sally looks for both popular news and scholarly sources for background and gathers a nice collection of journals and newspapers. She has to visually scan the library's small collection of newspapers for any breaking news on the story.

Evaluation
Since the resources available to Sally have been selected by professional librarians, little time needs to be spent in the evaluation of credibility of the material. Traditionally-credentialed authors and reliable publishing houses are the hallmarks of a carefully-developed library collection. Sally realizes that she is going to have to work hard to ensure that her resources on this breaking story are as current as possible. Her reference list is going to contain far more background material than new content and she is concerned.

Organization/synthesis
Sally uses note cards to gather information about her topic and then organizes her information in an outline form. When she is ready, she writes in the expository voice, maintaining a carefully objective point of view.

Documentation
Having diligently kept track of her sources on index cards, Sally spends a large amount of time on a bibliography that conforms to specifics of MLA citation style. Each element of the source is in its proper place and each punctuation mark is carefully checked and re-checked. Sally's bibliography and endnotes will be heavily -weighted in the final grade.

Communication
Sally's final product is an 8- to 10-page typewritten "report" which is only read by the teacher. Sally may save the paper but she is not keeping a formal portfolio of her academic work.

Final grade
A for content, and A- for mechanics (fewer than two errors per page).

2005 (Web 1.0)

Sally Spears is a high school junior very interested in environmental issues. The learning emphasis at her high school is on "information literacy." The Big6™ information literacy process and similar state-designed models provide Sally's library media specialist the framework for assignments. So too does the second edition of AASL's and the Association of Educational Communications and Technology's (AECT's) *Information Power* (1998), with its information literacy standards and new emphasis on technology and partnerships for learning. The International Society for Technology in Education (ISTE) also has released its first set of National Educational Technology Standards (NETS), national standards for technology literacy. Its six categories of proficiency are basic operations and concepts; social, ethical, and human issues of technology use; productivity tools; communication tools; research tools; and problem-solving and decision-making tools.

Development of question
When the opportunity arises to research a controversial issue, Sally eagerly proposes an investigation of the environmental impact of the recent Hurricane Katrina. Given the huge number of resources now available via the Web and powerful new search engines, Sally has to carefully narrow the focus of her research by asking a specific question about her topic: Would the restoration of coastal wetlands mitigate the impact of future Katrina-like storms in the Gulf? Sally does some "pre-searching" to determine the resources available to her using *Google* and *Wikipedia*.

Finding resources
While Sally begins her search using Google and Wikipedia, she realizes that her high school library web site offers a number of databases that offer news and other documents. Her media specialist is beginning to create online pathfinders to guide Sally in her research. The media specialist discusses possible sources with the class, reminding students of several magazine and newspaper databases that offer access to current issues. The media specialist shows Sally how to use the advanced search features in Google to refine her search, to search the "hidden web," and to use subject-specific search engines. She reminds the whole class to take home a list of database passwords. Sally is both excited about and a little frustrated by the sheer number of possible information sources available to her.

Evaluation
Sally recognizes that there is a real need for her to evaluate her sources using reliable criteria and to be able to defend the reliability of the resources that she chooses. She realizes that database searches likely will yield the types of sources her teacher wants to see in her list of works cited. But Sally wonders if there is a way to connect with people who are on the ground. She uses e-mail to contact a wetlands expert in Florida for his perspective on the issue and awaits a response.

Organization/synthesis
Sally's media specialist recently introduced the commercial online citation generator *NoodleTools* as a strategy for managing sources and documenting her work. Sally has to cite not just books and periodical articles but also web sites, e-mail, and electronic reference materials. She takes advantage of the outlining and formatting tools built into her word processing program while she is writing the required drafts of her paper.

Communication
Sally is required to word-process her document and to submit at least two drafts to her teacher before turning in the final project. A part of her assignment is to develop a PowerPoint presentation to accompany an oral report to her class about her findings. Sally's media specialist is instrumental in helping her import graphics and a video clip into the slideshow and suggests design strategies for effectively combining bullet points and graphics.

Sally stores an electronic copy of her paper on a 3.5-inch disk along with her personal printout and shares it with her teacher. She rehearses and tries to present looking at her audience - the class - without reading from her slides.

Final grade
A for content, A- for mechanics, A+ for formatting, and A+ for her slide show.

2010 (Web 2.0 / Social Web)

Sally Gaga is a high school junior very interested in environmental issues. The learning emphasis at her high school is on developing "information and media fluency." The new information landscape is participatory. School libraries are playing a growing role in what is now being called *transliteracy,* the ability to read, write and interact across a range of platforms, tools, and media. Those involved in Sally's learning life are influenced by ISTE's *NETS Refreshed* - with their new focus on creativity and innovation, communication and collaboration, research and

information fluency, critical thinking, and digital citizenship - and AASL's *Standards for the 21st Century Learner,* which focus on inquiry, critical thinking, creating new knowledge, personal growth, and participating ethically and productively as members of our democratic society. Those who are helping Sally to learn and grow are far more connected to each other through their intersecting *professional learning networks* which include their blogs, tweets, Nings, other social networks, and easy shared access to current research across disciplines. Credibility for Sally's educators' ideas now comes from application in the field as opposed to any single authoritative source or organization.

Development of question
When the opportunity arises to research a controversial issue, Sally eagerly proposes an investigation of the environmental impact of the recent BP Gulf oil spill. The teacher encourages Sally to explore a dimension of this event that resonates personally with her. Sally one day hopes to run her own restaurant and she chooses to study the impact that the spill will have on seafood availability.

Sally is in the habit of setting up a research wiki to share her progress with her classroom teacher, her teacher-librarian, and her fellow students who will help peer-edit and review her work.

Finding resources
The students in Sally's 1:1 classroom begin their research on their classroom laptops. Sally's teacher librarian worked with her teacher to create a pathfinder for hot issues research. The librarian drops in to give the class opening guidance and to remind learners of some newer search options. Sally checks the online catalog to locate print, e-books, and a variety of relevant media. She knows about Google's newer features such as WonderWheel and Timeline. She embeds some of the e-books she finds on Google Books on her research wiki. Sally also seeks video information in her search. She finds video news to be an excellent starting point for developing background knowledge and vocabulary around the issue. She grabs links for relevant videos and, when she can, embeds those too for easy access.

Sally knows that scholarly content will add power to her argument. After visiting databases the teacher librarian recommends on the library's website, Sally sets up e-mail alerts and RSS feeds so that new content is pushed to both her e-mail inbox and the RSS reader that she has set up in her research wiki. Rather than revisiting Google day after day, after establishing search terms and tags she sets up alerts there too.

Sally knows that research can continue 24/7. Her favorite databases are now available via cell phone apps so she can do some of this research during soccer practice. She remembers the trusty JSTOR widget she embedded on Facebook so she can get scholarly articles on the scientific impact of environmental catastrophes. Sally uses cell phone apps to search for local fish restaurants, e-mails (or texts) a few proprietors, and arranges a Skype session with a Gulf restaurateur for a personal, credible statement. Sally knows that she can e-mail or text the library or teacher-librarian for support during each stage.

Sally now can access a variety of opinions - and examine news from a variety of lenses - as she tries to discover *truth*. Blogs, wikis, tweets, and real-time news are all now at her fingertips. *Mashpedia* is one real-time source her teacher-librarian introduced to pull together a variety of new information formats with constantly updating feeds. To exploit any real-time search tools, Sally must first determine the best hashtag for searching real-time news story. Who is tweeting or blogging about the issue? Is BP updating the news? Are people living on the Gulf sharing? What about the U.S. government?

Evaluation
Since Sally is using sources of information such as Wikipedia, blogs, and personal information sources, she will have to triangulate (verify via multiple sources) her gathered information to determine its authority and authenticity. She looks for bias, both stated and hidden. Bias is to be understood and noted, not necessarily avoided. Though finding current information is not a problem, Sally must examine at what point in the story each particular tweet or post or document was written; she considers why it was written and by whom.

Organization/synthesis
Sally uses a web-based mind-mapping strategy to help her discover patterns and relationships in her findings. She embeds this mind map in her research wiki to share with her teacher and teacher-librarian, along with her progress reflections.

Sally also shares Google docs that she is using to draft her written project and storyboard her video with those others who are involved in her project: her teacher-librarian, her teacher, and the restaurateurs.

Documentation
Sally has the option of using fee-based NoodleTools or a variety of free citation generators for creating her lists of works cited and works consulted. This time around she opts to use the free *Bibme*, which actually pulls most of each citation from a database and then formats all of her citations. Sally will include live links to her online sources in her final products and knows to cite

not just textual materials but also the visual and audio data that she used. With the help of the teacher-librarian, Sally interprets and applies Fair Use guidelines as she selects what materials she can and will use. She also seeks to use Creative Commons music and images when she can. She plans to assign a Creative Commons license to her own work so that others may remix it under conditions that she can control.

All of these formative steps are visible to Sally's teacher in the wiki she maintains for this major project. No need to submit outlines and drafts; the teacher-librarian helped Sally's teacher set up an index of her students' sites so they both might watch and intervene as students progress. She and the librarian can interact with Sally to ask her pointed questions and guide her work.

Communication
Sally is proud of what she is learning and excited about the video she currently is story-boarding and soon will be producing. Sally considers publishing her work online in the form of a public service announcement on *YouTube*, *Vimeo*, or any of a number of other portals for sharing. The broader audience raises Sally's level of concern about the quality of her work. She recognizes the power that images - photographs, graphics, and charts - can play in helping her get her message across in powerful ways. Sally's teacher-librarian helps her put her video together and upload it to a public video portal.

Sally considers her online academic digital footprint and the impact that her work may have on her college studies and her future career. She asks herself, "Will an extreme point of view hurt my chances of getting a job with a more traditional company?" and "Will others be impressed with my academic and intellectual efforts? And, perhaps even more importantly she asks, "Will it make a difference?"

She also opts to publish her formal paper using one of an array of public digital tools in the *cloud - Issuu*, *DocStoc*, *Lulu*, *Yudu* - that make her work look truly professional and will be available to others long after her school accounts are no longer active. Sally sees that her work in high school is part of a life-long portfolio necessary for advancing in her career.

Final grade
A non-graded, practically self-created, assessment tool helps Sally determine her areas of strength (clear writing style, good organization) and areas for development (need to see creative insights into work, consider a more global perspective of problem). Continuous peer and teacher assessment during the project is more meaningful and helpful to Sally than a final "grade." Sally considers herself a co-learner along with her teacher, her teacher-librarian, and

her peers as she experiments and uses powerful and purposeful new tools that seem to appear almost daily.

The evolution of information literacy

What has changed for our *Sallies* over the course of more than twenty years?

1. Information is so much more accessible and students' choices of sources have grown exponentially. Learners can construct original research with new survey tools. Depending on the context of the information task, students must consider whether they have the right balance of a growing array of sources in traditional and emerging media.

2. Evaluation of information sources has become more important, more sophisticated and more subjective. Each of us must develop the ability to triangulate the flood of information and media available to mediate *truth*.

3. For digital citizens, attribution is still the right thing to do. Careful documentation builds academic integrity and prepares learners for scholarship. Online citation generators make the work a bit less onerous and a lot more collaborative. But documentation has grown in complexity, forcing students, online generators, and style guides to attempt to keep up with continually-emerging formats.

4. Intellectual property issues require more sophisticated discussion, as Creative Commons becomes an alternative to copyright and as learners themselves remix media. In a remix culture, student producers must learn about current guidelines for using copyrighted materials from the point of view of the creator, not just the consumer.

5. Learners have new strategies for synthesis. A new array of cloud-based brainstorming, mindmapping, timelining, and storyboarding tools are available, creating rich opportunities for collaborating and sharing.

6. The library collection is both physical and virtual. In addition to expanding the notion of what books physically look like, libraries collect and lend tools for production. Through dynamic pathfinders and websites, librarians not only lead learners to content but also to Web-based tools for telling new stories. A school library's collection also may now include students' work and, by doing so, validates and celebrates students' new knowledge.

7. The read/write Web has created a genuine audience for student work. Student communication products reach beyond the traditional term "paper" and include media appropriate to and effective for their message. Audience gives students a higher level of concern about the quality of their work and encourages them to have impact on the greater community of interest. Because communication is the end product of research, librarians guide learners in creating projects that best present their newly-constructed knowledge.

8. Today's libraries are not only places to get stuff. They are places to make stuff and do stuff and share stuff.

9. The Web makes research a far more independent effort but, with the use of platforms such as blogs or wikis or Google sites, the process now can be transparent and interactive. Teacher-librarians help move the research process online, using strategies that some are calling *knowledge-building centers*.

10. The role of the teacher-librarian has shifted from one who gathers, stores, and indexes resources to that of an educator and collaborator who helps students ethically and effectively filter, evaluate, and use information and then do something with it, ideally to communicate in powerful ways with authentic audiences. The librarian becomes an even more critical player in new learning landscapes where information and communication options continually shift.

Resources

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Additional Resources

Doug's Blue Skunk blog: http://doug-johnson.squarespace.com
Doug's Website: http://www.doug-johnson.com

Joyce's Springfield Township HS Virtual Library: http://springfieldlibrary.wikispaces.com
Joyce's NeverEnding Search Blog: http://blog.schoollibraryjournal.com/neverendingsearch

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