



See Sally Research: An *Environment Scan* of the Evolution of Student Research Project from Exxon Valdez to the Nuclear Crisis in Japan

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Abstract:

In a little more than twenty years we've migrated from information deserts to information tsunamis. Teacher librarians have never had more to teach; they've never had more to learn. This paper presents a scan of the evolving information and communication landscapes and the shifts and challenges facing learners and teacher librarians.

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 learning and growth and for their participation as citizens.

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 AASL's *Information Power* was published in 1988, defining the role of the school library in the school and school librarians are using 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 has created bibliography of resources and pulled a cart of materials related to controversial issues, but she 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 yet even connected 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, 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. But 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 heavily weighted in the final grade.

Communication:

Sally's final product is an 8-10 page type-written "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 content, A- 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, as does the second edition of AASL's and AECT's *Information Power*, with its information literacy standards, and new emphasis on technology and partnerships for learning, published in 1998. Also that year, ISTE released its first set NETS, national standards for technology literacy. Its six categories of proficiency: 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 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 website offers a number of databases that offer news and other documents. Her media specialist is beginning to create online pathfinders to guide her 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 possible information source available to her,

Evaluation:

She recognizes that there is a real need for her to evaluate her sources using reliable criteria and be able to defend the reliability of those resources she chooses. She realizes that database searches will likely yield the types of sources her teacher wants to see in her works cited list. 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. She 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 websites, 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 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 content, A- mechanics, A+ on formatting, and A+ on her slide show.

2010 (Web 2.0/Social web)

Sally Gaga is a high school junior very interested in environmental issues. The emphasis is on developing “information and media fluency.” The new information landscape is participatory. School libraries are reading about a new focus on *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* with their 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, and 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 the spill will have on seafood availability.

Sally is in the habit of setting up a research wiki to curate her own digital content and 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 class in Sally’s one-to-one school begins its 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, ebooks, and a variety of relevant media. She knows about Google’s newer features such as WonderWheel and Timeline. She embeds some of the ebooks she finds on Google Books on her research wiki. Sally also seeks video information in her search. She finds video news an excellent starting point in developing background knowledge and vocabulary around the issue. She grabs links for relevant videos and when she can, she 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 email alerts and RSS feeds so new content is pushed to both her mail box and the

reader she sets 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 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, emails (texts) a few proprietors, and arranges a Skype session with a Gulf restaurateur for a personal, credible statement. Sally knows she can email or text the library or teacher-librarian for support in each stage.

Sally can now access a variety of opinions, and examine news from a variety of lenses, as she tries to discover *truth*. Blogs, wikis, tweets, real-time news. 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, blogging about the issue? Is BP updating the news? People living on the Gulf? The US government?

Evaluation:

Since Sally is using sources of information such as *Wikipedia*, blogs and personal information sources, she will have to triangulate (verify in 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 she is using to draft her written project and storyboard her video with those others involved--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 works cited and works consulted lists. This time around she opts to use the free Bibme, which actually pulls most of the citation from a database and formats her citations. She will include live links to her online sources in her final products, and knows to cite not just textual materials, but visual and audio

data used. With the help of the teacher-librarian, Sally interprets and applies Fair Use guidelines as she selects what materials she will 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 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 in their 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 the video she is currently story-boarding and will be producing. Sally considers publishing her work online in the form of a public service announcement, on YouTube, or 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 the impact her work may have on her college studies and her future career, her academic digital footprint. She asks herself: "Will an extreme point of view hurt my chances of getting a job with a more traditional company?" "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.

2011 and beyond (Curating Knowledge/Making a Difference)

Sally Gaga is now a high school senior, still very interested in environmental issues.

The focus now is clearly on developing “transliteracy” and meaningful participation. Sally’s librarian models the value of curation of Web knowledge. Sally, herself, is comfortable aggregating content in all media forms, creating information portals to meet her interests and information needs and contexts. Her teachers and librarians help Sally and her classmates understand how to remix the various available media channels to create new content that addresses authentic needs and reach real audience.

Development of question:

Sally has been interested in Japan ever since she read *Sadako and the Thousand Paper Cranes* when she was in fourth grade. So, on March 11, when an earthquake in the Pacific causes a tsunami in Japan, forcing the evacuation of hundreds of thousands, and causing the potential for nuclear disaster, Sally is concerned. A few weeks later, tornadoes hit Missouri and Alabama and Massachusetts. Again and again Sally watches as unprepared residents are forced to evacuate their homes and businesses. Sally wonders if the lessons we might learn from these events have meaning for her little township in suburban Philadelphia. Should an environmental tragedy strike: *Does my community have a plan? Do my neighbors know what to do and where to go?*

Finding resources:

Using Mashpedia, Sally identifies real-time news sources in multiple media formats. She *grabs* a number of relevant RSS feeds from the more reliable and most relevant of those sources. She also sets up search feeds and alerts in her favorite databases to assure pushes academic content to her readers and her wiki. Sally identifies and follows the Twitter stream for #japantsunami. This hashtag leads Sally to the discovery of the English translation of a powerful, but anonymous blog written by a Japanese nurse who cared for the victims of the tsunami and fellow relief workers. Sally curates all these feeds and sources in her research wiki, also considering tools like Tumblr and Diigo to search tags and to store additional content and links.

Sally now carries much of her library with her wherever she goes. Most of her favorite, reliable databases are now available as mobile apps and feed her dynamic content. She regularly uses Twitter to direct message her librarian, as well as other tweeters she feels might offer her reliable expert updates.

Sally narrows her research question to explore the effectiveness of plans for preparedness in the face of weather catastrophe and seeks content relating to planning relief efforts. Sally discovers she can link to and follow storm feeds from the NOAA (the National Oceanic and Atmospheric Administration)

Because she is moved to create media that will have local value, Sally searches specifically for local government documents to examine models of community preparedness plans. But a term paper or a video, however well researched, is not the best platform for sharing her new knowledge. Sally plans to apply what she learned about recent environmental disasters and put that new knowledge into action in her own community. She also wants to gain insight about her own community's current level of disaster preparedness. Toward that end, she works with her librarian and her statistics teacher to develop an original survey instrument which she gets permission to share on the school district's website.

Evaluation:

The volume of available media channels requires Sally to seriously filter the flow of her abundant content and feeds. She understands that, as a 16-year-old, her Google search profile may have what Eli Pariser refers to as a personalized "filter bubble." Her Google results likely look different from the results of an adult environmentalist. Sally knows that reaching beyond the standard search box and logging out of her Google account may help avoid her limiting personalized profile. She is also aware that not all news sources are western and is happy to discover the English language video news and feeds updates provided by NHK News in Japan. But she wonders if government news actually presents truth or *spin*. As for the nurse's moving blog posts, the recent controversy about the "Gay Girl in Damascus" blog force Sally to wonder about the authenticity of that anonymous blog and to more carefully scrutinize all of the social media she encounters.

Sally seeks help from her statistics teacher and her librarian to interpret, evaluate, and accurately report the data collected in her community survey.

Organization/synthesis

In a transparent manner, Sally continually shares her research progress and her draft of a preparedness plan with her teacher and librarian in her research wiki and through her shared Google doc and storyboard. The teacher and librarian check her progress and make regular suggestions.

Documentation:

Sally continues to use Web-based citation generators and electronic notecard programs to help her attribute credit to her sources and media. She continues to use Creative Commons media in her work and plans to generously license the original work she wishes to share with her township.

Communication:

Sally considers the best strategy for communicating and sharing her proposal for a local preparedness plan. She decides she can contribute in several ways with her research. She can work with the police and fire departments to create and curate a page on the township site that aggregate the resources—instructional media, maps,

data, alerts, advice--her community might need in preparing for major, unexpected weather events. She borrows a library video camera to shoot and narrate video of evacuation routes to include on the site. She plans to use Google Maps and Google Earth imagery to help plan and illustrate strategies.

Final Grade: Sally's teacher and librarian act as consultants. They help her plan and edit her media and organize and evaluate her prototype portal before she submits it to the township supervisor. She asks to communicate her findings and suggestions in an upcoming town hall meeting. On her research wiki, she reflects on both her process and her product. She conferences with her teacher and librarian to determine her grade. But her more meaningful *grade* will likely be the feedback and possible acceptance of her prototype portal at the town hall meeting.

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

1. Our learners' information and communication choices 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, more contextual, 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 continues as 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 with students, and online generators, and style guides attempting to keep up with continually emerging formats.
4. Intellectual property issues require more sophisticated discussion, as Creative Commons becomes and increasingly attractive and rich alternative to copyright and as learners themselves remix media. In a remix culture, student producers must learn about current fair use guidelines for using copyrighted materials, from the point of view of the creator, not just the consumer.
5. Learners have new strategies for synthesis. An array of cloud-based brainstorming, mindmapping, timelining, outlining, and storyboarding tools are available, creating 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 to web-based tools for telling new stories. A school library's collection also may now include students' work, and by doing so, it validates and celebrates learners' new knowledge.
7. The read/write Web creates new and genuine audience for student work. The real world is not reading term papers and student communication products reach beyond the traditional to include new 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 powerfully present newly constructed knowledge.
8. Today's libraries are not only places to get stuff. They are places to question, invent, create, publish, and share.
9. The Web makes research a far more independent effort, but with the use such platforms as blogs or wikis or Google sites, the process can now be transparent and interactive. Teacher-librarians help move the research process online, using strategies some are calling *knowledge building centers*.
10. Curation adds context to gathered content. It adds necessary value to search. Librarians must model, and learners must master, curation strategies to be able to manage their information worlds for today and tomorrow.
11. The role of the teacher-librarian has shifted from one who gathers, stores, and indexes resources to a educator and collaborator who guides learners as they ethically and effectively filter, evaluate, and use information and then do something with it, ideally to communicate in powerful and creative ways with authentic audience. The librarian becomes an even more critical player in new learning landscapes where information and communication options continually shift.

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* **Environmental scanning** is a process of gathering, analyzing, and dispensing information for tactical or strategic purposes. The environmental scanning process entails obtaining both factual and subjective information on the business environments in which a company is operating or considering entering. Wikipedia

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