Qualitative Research Study
on
Profiles in Science

Prepared for:

UNITED STATES
National Library of Medicine
NLM

April 30, 2009

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Background

The National Library of Medicine (NLM) conducted an online evaluation in April 2009 to enhance its Profiles in Science Web site (**http://profiles.nlm.nih.gov**).

The primary goal of Profiles in Science is to make the archival collections of twentieth century leaders in science, medicine, and public health accessible to researchers, educators, students, and the general public through the World Wide Web.

The objectives of this qualitative study were to evaluate and enhance the Profiles in Science Web site; to understand the site's strengths and weaknesses; and to gauge the overall value of Profiles in Science to its primary target audience.

These four online focus groups were conducted on April 20th and 21st, 2009 at 7:00 and 8:30 p.m. Eastern time each evening.

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Objective. The main objective of this qualitative study on the Profiles in Science Web site was to evaluate the strengths, weaknesses, and usefulness of the site to potential users.

Target respondents. Participants were recruited and grouped into four categories:

- ✓ Historians and Researchers
- ✓ Healthcare professionals and Scientists
- ✓ Students (e.g., high school, undergraduate, graduate, or medical school)
- ✓ Educators and Librarians.

All were asked to spend a minimum of 20 minutes navigating and using Profiles in Science site prior to the discussion. While all participants spent at least the minimum amount of time prior to the focus group, the majority of participants were new to Profiles in Science.

- Testing consisted of FOUR online focus groups with Historians/Researchers; Healthcare professionals/Scientists; Students; and Educators/Librarians.

- Participants were recruited listserv postings within the relevant target audience category.

- Each session lasted approximately 90 minutes. The group of Historians/Researchers was comprised of 8 participants; the group of Healthcare professionals/Scientists was comprised of 9 participants; and the groups of Students and Educators/Librarians were *each* comprised of 7 participants. (See Appendix for Participant Profiles.)

- The group was asked to visit Profiles in Science in advance of the discussion, and each user was assigned a user name and password to participate in the focus group.

- All participants were offered an incentive payment of $75, unless waived for professional reasons.

* The online focus group represents a qualitative methodology used for the purposes of ideation, brainstorming, and evaluation. Qualitative methodologies are particularly useful for interpreting the observations of focus groups with small numbers of participants. The findings of such groups are intended to be reflective of the community at large but should not be statistically generalized to a larger population.

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Impressions, Strengths, and Areas for Improvement on Profiles in Science

- Reactions to **Profiles in Science** are **favorable** overall.

- While most say they would be very likely to use Profiles in Science, the majority of respondents currently find such information via current online sources (e.g., Google, Wikipedia, and library or university archives, both online and in hard copy).

- Respondents report several challenges with their current sources, though, including concerns about reliability and accuracy, lack of depth, and difficult navigation and poor organization (of online sources).

- The Profiles in Science site's primary **strengths** include:

  o the presence of a credible resource of unpublished digitized documents provided by a reputable source available and accessible to the public

  o general simplicity of using the site

- The main **weaknesses** of Profiles in Science include:

  o the site's look and feel, generally seen as outdated and in need of an update

  o perceived lack of a clear purpose in both direction of site and intended audience

  o inconsistent or unclear terminology (e.g., MIME)

  o the search feature, which some see as "too technical"

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Navigation, Challenges, and Look and Feel

- Reactions to the navigation on *Profiles in Science* vary: Some find it easy to use, while others think it is inconsistent and unnecessarily complicated.

- The main challenge for *Profiles in Science* is for the design of the site to better represent the wealth of information it offers. Currently, its external/outward appearance masks its potential.

- The look and feel of *Profiles in Science* must match its complexity and richness of content with an updated and more professional design.

- The text-heavy look of each screen inhibits the site user from accessing the information available within the profile. Respondents would like to see the text broken up by additional visuals, graphics, sub-categories, and smaller sections.

- The majority of respondents encounter difficulty with the search feature – whether finding what they were looking for or with refining the search results afterward.

- While the design of the site appears to be geared toward a younger audience (middle school or high school), the content itself seems geared more toward a professional audience.

Likelihood to use and to recommend

- Despite the current challenges, nearly all respondents are highly likely to use *Profiles in Science* – either for their own personal use or as a teaching tool for students.

- Similarly, respondents are very likely to recommend *Profiles in Science* to colleagues, friends, family, and those who are merely curious about science and the history of medicine.

Following are additional findings from the online focus group evaluation of Profiles in Science.

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- Respondents reported having searched for information in a variety of topics related to the sciences – e.g., scientists' biographical background, histories of diseases or conditions, historical figures in medicine, women in science, and inventors of medical instruments.

- Respondents reported **challenges** they have encountered in finding information online, such as concerns about bias and the accuracy of the information, conflicting information, difficult-to-navigate and text-heavy sites, disorganized or poorly organized sites, lack of depth/detail, and cumbersome search tools within sites.

- To **resolve** these challenges, respondents reported that they find alternatives such as calling a contact number from the site or archive, double- or triple-checking the information against other sources (often by returning to other listings among Google search results), or going to a library in person to check alternate resources.

- Google and Wikipedia were at the top of most lists of resources (online as well as not online). In addition, respondents reported using the following resources, among others:

    o academic center libraries, professional journals, ERIC, JSTOR

    o Medline, PubMed, The Global Health Archive, PAO (Periodicals Archive Online)

    o WHO (World Health Organization), National Academies
      (*http://www.nationalacademies.org*)

- Few respondents had heard of or visited Profiles in Science prior to learning of this focus group.

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On the Profiles in Science site, respondents particularly **liked** the visual materials, photographs (including the photo credit), letters, correspondences (especially in HTML format), original documents (especially those not available elsewhere), the biographical sketches, the simple interface, and the depth of content.

On the other hand, the overall site design of Profiles in Science was generally perceived as a **weakness**. Many respondents **disliked** the look of the site, saying that it seemed like it was *"designed in the 90s,"* and that it looks rather *"simple," "old"* or *"antiquated."*

Others **disliked** that Profiles in Science seemed to **lack a clear audience**, while still others had difficulty with the absence of a "nav bar" (e.g., tabs or other navigation conventions).

Some of the suggestions for change that emerged at this point included:

 o *Including more biographical profiles*

 o *Improving the search feature and functionality*

 o *Transcription of the correspondences*

 o *Updating the graphical user interface (look and feel) or the site*

 o *Including a search box on the home page*

 o *Restructuring the content with sub-categories*

 o *Making it easier to get back to the Home Page or main page from anywhere on the site.*

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- **Ease of reading the text** on the Profiles in Science Web site was rated by each group: Historians/Researchers, Healthcare Professionals/Scientists, Students, and Educators/Librarians. Ratings were on a scale from 1 to 5, with 1 indicating **VERY EASY to read** and 5 indicating *special TECHNICAL KNOWLEDGE required*.

- All four groups rated the site as relatively easy to read, with average scores ranging from **1.22** to **2.44**.

- **Healthcare Professionals/Scientists** gave the highest readability scores, with **6** of 9 respondents giving the best possible rating of 1, while two rated the site 1.5 and one rated the site a 2, for an average rating of 1.22.

- In the **Educators/Librarians** group, ratings ranged from 1 (very easy) to 3.5 (fairly difficult), with **3** of the **7** respondents giving a rating of 2, and an average rating for the group of 2.36.

- In the **Historians/Researchers** group, all 8 ratings were between 1.5 and 3, but with 2 ratings of 2.5 and three ratings of 3, the average rating was 2.44, the lowest of the four groups.

- Ratings from the **Students** group were similar, with all 6 ratings between 1.5 and 3 and an average rating of 2.42.

- Many respondents found the overall look and feel of Profiles in Science to be "simple" – a positive feature for some but for others may "mask" the wealth of information within the site.

- While some liked the clean appearance (with mixed reviews on the white background), the majority described the site look and feel as "dated," "old," "boring," and "spartan."

""Simple format. Nice concept for a website." (Maribeth, Healthcare Professionals/Scientists)

"I liked that it had very organized information about the particular areas in medicine - such as: biomed, health and med, fostering sci, etc …" (Amanda, Healthcare Professionals/Scientists)

"… the right hand corner feature on McKusick was the 'friendliest' part of the website. Why? because it directly engaged and addressed the viewer." (Jeremy, Students)

"The site is not particularly attractively designed. It feels old and unloved." (Debbie, Educators/Librarians)

- Particularly in contrast to the depth detail within each profile, Profiles in Science struck many as having an outward appearance that does not accurately represent the richness that is within the site.

- Many respondents acknowledged the valuable content and the credible nature of the information – coming from the NLM – but felt that the site needs an update and a "more professional" appearance.

> *"I think again it's overly simplistic for the amount … available; i.e., primary sources for pictures, correspondences etc. It would be a shame to exit out of this website bc it LOOKS like there isn't that much here, but I wouldn't overload the homepage...."* (Kate, Students)

> *"… the content is great. It's just the presentation; it seems like a website from 1998 (please don't take that in a mean way)."* (Maribeth, Healthcare Professionals/Scientists)

> *"… I wouldn't want it to be all flashy and glitzy, but it does look very...I don't know if primitive is the right word, but like a very basic site that even I could have designed."* (A'Llyn, Educators/Librarians)

> *"I kind of didn't think that it was snazzy enough! I also thought the FAQs should of been on the home page or at least clearly linked to the home page."* (Melanie, Historians/Researchers)

> *"It seemed more official than other websites … It seemed to have more solid reference material, and it said National Library of Medicine."* (Gabriel, Healthcare Professionals/Scientists)

Looking at the Profiles in Science home page, respondents **expected** to be able to accomplish a variety of tasks. Overall, these expectations were met, but respondents encountered difficulties along the way.

> *"I expect to get basic facts, to get good pictures for lectures, perhaps a site to introduce students to a subject, and maybe to get a sense of what is in the paper collection."*
> (Hannah, Historians/Researchers)

> *"Biographic and anecdotal information about people who contribute to science and medicine. Not so much the things they actually worked on...much more lay."*
> (Kate, Students)

Profiles in Science
NATIONAL LIBRARY OF M...

Home | Search | Browse | What's New | About

Featuring: The Victor A. McKusick Papers

Victor A. McKusick, an innovative clinician, medical educator, and researcher, was widely considered to be the founding father of medical genetics.

Welcome to the National Library of Medicine's Profiles in Science site!

This site celebrates twentieth-century leaders in biomedical research and public health. It makes the archival collections of prominent scientists, physicians, and others who have advanced the scientific enterprise available to the public through modern digital technology.

Biomedical Research

Christian B. Anfinsen | Oswald T. Avery | Julius Axelrod | Paul Berg | Francis Crick | Rosalind Franklin | Donald S. Fredrickson | Michael Heidelberger | Arthur Kornberg | Joshua Lederberg | Salvador E. Luria | Barbara McClintock | Victor A. McKusick | Marshall W. Nirenberg | Linus Pauling | Martin Rodbell | Florence R. Sabin | Maxine Singer | Sol Spiegelman | Albert Szent-Gyorgyi | Harold Varmus

Health & Medicine

Virginia Apgar | Edward D. Freis | C. Everett Koop | Wilbur A. Saw...
General | Visual Culture and H...

> *"I expect to be able to understand what is included in the site, understand how it is organized, understand who develops/maintains it, and understand how to get more information … I also expect to be able to search AND to move around within the library."*
> (Melanie, Educators/Librarians)

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- For some, the category distinctions were unclear. For others, Profiles in Science lacked direction and audience.

  > *"First of all, what is the purpose of the Profiles in Science? Researchers, Students (which level?), Educators, or Physicians? Currently, the site is designed more for researchers."* (Anny, Educators/Librarians)

  > *"The website needs a vision statement … right now the welcome provides a descriptive statement, but doesn't tell the audience what the goal is for the viewer … based on the current web design, the only audience is the academic researcher or documentary filmmaker/biographer."* (Jeremy, Students)

- Perceptions of intended audience varied significantly, with conflicting reactions across respondents and across groups.

- Based on design (look and feel) alone, some respondents claimed that students (middle school, high school) would *not* find the site useful because of their attraction to more "engaging and interactive" sites. On the other hand, some respondents claimed that it is the *simplicity* of the site that makes it most relevant to a younger (student) audience.

  > *"Arguably it appeals to a wide audience. The interface is simple and clean enough that a high school student could use it. The content is rich enough that a professor/instructor can use it for material."* (Vitaly, Healthcare Professionals/Scientists)

  > *"… younger students are looking for something more engaging and interactive than these pages."* (Debbie, Educators/Librarians)

- Based on other criteria – such as content and ease of navigation – most respondents felt the site was more suited to researchers and those "looking for information."

  > *"Right now, it seems like it strictly for historical researchers and academics."* (Jeremy, Students)

  > *"… students and other researchers who were looking for information in these areas."* (Marcia, Historians/Researchers)

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- Some respondents felt that there was *too much* detail in the current design – to the point where the text inhibited finding certain information.

- Other respondents, however, were satisfied with the *amount* of detail but suggested *sub-dividing* the content into smaller categories.

"I think that the site, as it's presently designed, is more suitable for a researcher or someone who needs fairly comprehensive information (as for a report). Perhaps it's overkill for the general public." (Debbie, Educators/Librarians)

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me | Search | Browse | What's New | About

A. McKusick Papers

Biographical Information

- Biographical Information
- From "Musical Murmurs" to Medical Genetics, 1945-1960
- The Bar Harbor Course and "McKusick's Catalog," 1960-1980
- Beyond the Clinic: Genetic Studies of the Amish and Little People, 1960-1980s
- Medical Genetics, Molecular Biology, and the Human Genome Project, 1980-2008
- Glossary
- Further Readings

Documents

" … there was a good amount of information, but not overwhelmingly so." (A'Llyn, Educators/Librarians)

"It's a good balance...appropriate for younger students (high school, college, etc). For a more technical audience... probably not enough, but it is certainly a good jumping off point." (Vitaly, Healthcare Professionals/Scientists)

"I became known as a cardiologist. . .before I became known as a geneticist. Some thought I was committing professional suicide in leaving cardiology to focus on rare and "unimportant" genetic disorders. They asked why I switched from cardiology to genetics. Actually it was a matter of phasing down cardiology and ramping up genetics after 1957." --Victor McKusick, "A 60-Year Tale of Spots, Maps, and Genes," *Annual Review of Genomics and Human Genetics* 7 (2006): 5

Victor McKusick is widely considered to be the founding father of medical genetics. An innovative clinician, medical educator, and researcher, he established the first medical genetics program and clinic at Johns Hopkins in 1957, conceived and compiled *Mendelian Inheritance in M*[...] phenotypes (first published in 1966 and now published online), and conducted landmark studies of hereditary disorders in [...] mapping the human genome, and was closely involved in the early years of the Human Genome Project, and served as fou[...]

"In order to find the information I had to wade through way too much text -- especially where Dr. McKusick finished his internship." (Cormac, Students)

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- Respondents would like to see additional categories and sub-categories, as well as clearer distinction between the current top-level categories.

- Some suggested listing the biographies in various ways – e.g., by topic, by date, alphabetically.

Biomedical Research

Christian B. Anfinsen | Oswald T. Avery | Julius Axelrod | Paul Berg | Francis Crick | Rosalind Franklin
Donald S. Fredrickson | Michael Heidelberger | Arthur Kornberg | Joshua Lederberg | Salvador E. Luria
Barbara McClintock | Victor A. McKusick | Marshall W. Nirenberg | Linus Pauling | Martin Rodbell |
Florence R. Sabin | Maxine Singer | Sol Spiegelman | Albert Szent-Gyorgyi | Harold Varmus

Health & Medicine

"… on the Home page I am not certain what the significance of the distinction between 'Biomedical Research,' 'Health & Medicine,' and 'Fostering Science and Health.' (Cormac, Historians/Researchers)

Virginia Apgar | Edward D. Freis | C. Everett Koop | Wilbur A. Sawyer | Fred L. Soper | Reports of the
Surgeon General | Visual Culture and Health

Fostering Science & Health

"We should have a category called '21th Century Distinguished Educators.' We should celebrate the everyday heroes that motivate and guide the next generations of physicians. These heroes may include a) Any clinicians and staffs at a teaching hospital, b) College/university faculty and staffs, and librarians, c) Any healthcare professionals who took time to mentor junior colleagues, d) Elementary and secondary school teachers, e) Science coaches/mentors." (Anny, Educators/Librarians)

Alan Gregg | Mary Lasker | Regional Medical Prog

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Respondents suggested a variety of **individuals** they would like to see profiled on the site, Among them were:

- Franz Boaz

- Harvey Cushing

- Michael E. DeBakey

- Paul Farmer

- Judah Folkman

- William Halsted

- Oliver Holmes

- Dean Kamen

- William Osler

- Santiago Ramon y Cajal

- Jonas Salk

"I'd like the people profiled to span several generations...not just all in the distant past. Maybe some folks still alive and contributing." (Danielle, Healthcare Professionals/Scientists)

"Perhaps of profile of current scientists 'off influence'; for example directors of NIH, CDC, HHS, etc." (Vitaly, Healthcare Professionals/Scientists)

"Is there a suggestion box where people who don't find a topic can suggest it? I also very much like the idea … about a special resource section for teachers." (Melanie, Educators/Librarians)

Among the **topic areas** respondents suggested adding to Profiles in Science were neuroscience, impact of environmental toxins on health, smoking, socioeconomic contributors to health, preventive medicine, integrative medicine, and Nobel prize winners.

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While a few respondents had little or no difficulty with the **Search** feature, the *majority* encountered challenges with its **visual design**, the **choices** offered in the check boxes, and the **terminology** (e.g., Metadata, MIME).

Home | Search | Browse | What's New | About

Search the Profiles in Science collections

Search

Search Help and Cautions

Select Database: ☑ *Documents* ☑ *Metadata*
Query: [   ] (Search) (Reset)

Include in Results display:
☑ Rank   ☐ Score   ☐ Metadata Excerpt ☐ Document Exce
☐ Modified ☑ Size (Bytes) ☐ URL   ☑ MIME-Type
Display the top [10 ⬦] items Go to Fielded Search or Expert Search

Fielded Search

Fielded Search Help and Cautions

(Search) (Reset)
        Title: [   ]
      Creator: [   ]
        Date: [>= ⬦] [   ] YY
                                      YY

> *"At first glance I was overwhelmed … I only used the top options to search, and that was for the 1964 surgeon generals report, which it did not locate."* (Amanda, Healthcare Professionals/Scientists)

> *"I did not like the look of the search feature. The boxes to check all the different formats (?): it was too technical. And the "Search help and Cautions" part. Cautions?!"* (Barbara, Historians/Researchers)

> *"… Search should have 'simple' and 'advanced' - most people don't know what MIME-type is. Search directly - put a box on the front page."* (Shira, Students)

> *"… I did try the search feature mostly just to try it. It was not super useful. I had better luck just clicking around the site."* (A'Llyn, Educators/Librarians)

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■ **Navigationally**, another challenge was determining how to refine or alter search results *within* the list.

■ Confusion over **terminology** emerged consistently for some. Further, one respondent overlooked the pull-down menu that allows the user to alter the number of items to be displayed.

Home I Search I Browse I What's New I About

Search the Profiles in Science collections

Search

Search Help and Cautions

Select Database: ☑ *Documents* ☑ *Metadata*
Query: [   ] (Search) (Reset)

Include in Results display:
☑ Rank ☐ Score ☐ Metadata Excerpt ☐ Document Excerpt
☐ Modified ☑ Size (Bytes) ☐ URL ☑ MIME-Type
Display the top [10 ▾] items Go to Fielded Search or Expert Search

Fielded Search

Fielded Search Help and Cautions

(Search) (Reset)
Title: [   ]
Creator: [   ]
Date: [>= ▾] [   ] YYYY-MM-DD and
        [<= ▾] YYYY-MM-DD

> *"I was surprised to learn that I can search for document type (rather than content) by clicking on the browse button. Many people missed this. Perhaps you should rename the icon."*
> (Anny, Educators/Librarians)

> *"Basically, the Watson/ Crick was easy once you figured out to search for the listed by type and not year, but it was impossible to switch the listing to be by type once you were already in the Crick papers. it defaulted to years and didn't give you another choice … The 'browse' feature is super useful, but it … changes based on what page or sub page you are on."* (Mordechai, Students)

> *" … I thought the Search page choices were too technical. There should be a definition of metadata. Also, why was the display limited to 10 items? Maybe to load more than that would be slow."* (Barbara, Historians/Researchers)

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Respondents explained that, for them, the features of a good search engine include **simplicity**, the ability to search in a **variety** of ways, and complex functionality "behind the scenes" that allows for an **easy** front-end user interface.

"The simpler the search screen the better. People today are too used to Google. They want to type in a string and find everything. I know that this is not the best way to really find information, and that libraries have years of experience in describing data. There has to be some compromise between the two, and the current search here is too library-ish." (Barbara, Historians/Researchers)

"I like search features that have different levels of complexity, where you have lots of options of types of searches (by name, keyword, subject) and lots of ways to expand or contract your field (by date, type of media, etc.) OR you can just do a straight-ahead, search everything for this word. Often it isn't the search engine itself, but how detailed the coding of the materials is that decides how useful a search engine is. And I have no idea how detailed the coding is for the objects in the NLM collection." (Hannah, Historians/Researchers)

"I have been searching the Web for many years, but have gotten spoiled by the more modern search engines which have a lot of behind the scenes algorithms to get you where you want to go quickly and accurately."
(Debbie, Educators/Librarians)

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■ For most, navigation was **easy** but could be **improved**, particularly in certain sections, such as the Search functionality (as described on Slides 23 and 24).

■ Adding sub-headings and visuals to the text may break up particularly text-heavy pages that come across to some as overwhelming.

> *"The layout was a little boring and kinda stiff academic style - a very academic looking picture of the person + lots of text when you first click on a person - more pictures on that one page to break up some of that text would've been prettier to look at than so many words at once."*
> (Betty, Healthcare Professionals/Scientists)

■ Some suggest using a format similar to Wikipedia – with all of the information on a **single page**, allowing the user to scroll up and down, rather than clicking through a link to another screen.

> *"The profile is divided into sections. With each section loading separately. This makes it cumbersome to go back to the previous section. I would rather just scroll up and down. Wikipedia's format for presenting the profile would be great."* (Pankaj, Historians/Researchers)

■ Another critical aspect in improving ease of navigation involved the **terminology** and appearance of **labels** on each screen. One respondent described her experience navigating the Crick papers.

> *"Have separate sets of links at top or bottom or both for both Profiles in Science AND for the collection in which you are currently working. Or at least differentiate the links by color or size. Having all the links in one line/group at the top is confusing. For example, if you are in the Crick papers, and you click on 'browse' at the top, you are browsing just within the Crick papers, not within the Profiles in Science site. But if you click on the 'home' button next to it, which is the same color and size, you are NOT going to the home/main site for the Crick papers, you are going to the Profiles in Science home."*
> (Melanie, Educators/Librarians)

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- The **majority** of respondents across groups said they were **very likely to use** Profiles in Science either as a resource for themselves or as a teaching tool to use with students.

"Yes, to learn more about profiled individuals (general knowledge) or conduct specific research using the primary sources available." (Elizabeth, Students)

"Yes, for research, for teaching, for teaching ABOUT doing research." Cecile, Historians/Researchers)

"I would absolutely use it for biographical questions about scientific figures--however, I don't get those very often. I might also use it for visual materials on general medical history, since it has those historical posters … " (A'Llyn, Educators/Librarians)

"Now that I know about it, yes, but would like more people profiled and more info about the people profiled." (Maxine, Healthcare Professionals/Scientists)

- Some, however, said they would be **unlikely** to use Profiles in Science in its *current* design.

"Yes, but not in the current condition. I would also use the site to create classroom projects using primary and second sources." (Anny, Educators/Librarians)

"Honestly I'm not even sure I would use it. At least part of my sense of the authority of a site is based on design, and if I were not familiar with The National Library of Medicine, I'm not sure I would trust the ethos of the site." (Cormac, Students)

- Others said they might use Profiles in Science periodically but only for **very limited** purposes.

"I might use it now, but probably not, unless I was teaching something to high school students and wanted to pull a document to show." (Gabriel, Healthcare Professionals/Scientists)

"Not unless I was doing a project that needed something like that specifically." (Betty, Healthcare Professionals/Scientists)

■ All of the respondents in the **Historians/Researchers** and in the in the **Healthcare Professionals/Scientists** groups said they would recommend Profiles in Science to their colleagues, friends, and students.

> *"Yes, I would recommend Profiles in Science to others in my field and for teaching purposes (so students). Actually to anyone interested in medical history."* (Sharon, Historians/Researchers)

> *"yes, to colleagues and family/friends that are non-scientists but curious folks."* (Danielle, Healthcare Professionals/Scientists)

■ The majority of respondents in the other two groups (**Students** and **Educators/Librarians**) were highly likely to recommend Profiles in Science as well.

Respondents suggested several ways of publicizing Profiles in Science. Among the suggestions were (followed by the group in which the suggestion was made):

- online networks (e.g., Cadeucus) *(Historians/Researchers)*
- AAHM newsletter and journal *(Historians/Researchers)*
- H-Net listservs *(Historians/Researchers)*
- JAMA, AMSA, The New Physician *(Healthcare Professionals/Scientists)*
- Conferences *(Healthcare Professionals/Scientists)*
- Wikipedia *(Students)*
- College/university faculty *(Students)*
- MLA (Medical Library Association) *(Educators/Librarians)*
- Chronicles of Higher Education *(Educators/Librarians)*
- Conferences (e.g., California Teacher Association) *(Educators/Librarians)*
- State Medical Associations or Societies *(Educators/Librarians)*
- Listservs associated with American Science Teachers Association (ASTA), American Medical Student Association (AMSA), and state teacher groups (e.g., MEDLIB-L) *(Educators/Librarians)*

Respondents also suggested several ways of making Profiles in Science more **relevant** to their respective audiences (listed below based on group):

- Include references *(Historians/Researchers)*

- Improve search feature *(Historians/Researchers)*

- Add profiles of minority scientists *(Historians/Researchers)*

- Make FAQs more prominent *(Historians/Researchers)*

- Increase awareness / Promote *(Healthcare Professionals/Scientists)*

- Clarify terminology *(Students)*

- Send out "monthly emails" (e.g., an opt-in newsletter) about profilee who was born that month, etc. *(Students)*

- Add RSS feeds *(Educators/Librarians)*

- Provide interactive quizzes or timelines *(Educators/Librarians)*

- Use icons instead of words *(Educators/Librarians)*

- Add a "how-to" tutorial to new visitors to the site *(Educators/Librarians)*

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- With few exceptions, the **Healthcare Professionals/Scientists** – based on this focus group data – vocalized the *fewest* challenges navigating the site.

- The **Historians/Researchers** group articulated the most enthusiastic responses when describing their likelihood to use Profiles in Science.

- Other than these, no particularly notable or significant differences emerged between groups.

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Actionable recommendations from these online focus groups include the following:

- ✓ **Define** the purpose or mission of Profiles in Science. (e.g., For whom is the site intended? What is its primary objective?)

- ✓ **Offer separate** sections designed for teachers (replete with learning/teaching tools) and for laypeople or students.

- ✓ **Address** complaints of "too much text" by adding sub-categories to break up the heavy-text pages.

- ✓ **Add** a tutorial on how to use the search feature.

- ✓ **Add** content, including profiles on scientists who are minorities or in low-recognition areas.

- ✓ **Include** topic areas such as neuroscience, environmental toxins, preventive medicine, and integrative medicine.

- ✓ **Have** a virtual "suggestion box," whereby site visitors can suggest topics and/or individuals that they do not find on Profiles in Science.

- ✓ **Position** the FAQs more prominently.

- ✓ **Include** references.

✓ **Ensure** consistent language and terminology throughout the site.

✓ **Follow** usability conventions such as providing navigational cues, directions, and guidance on each page and at each step along the way.

✓ **Distinguish** links by color, icon/graphic, font size, or other design techniques that help to visually separate individual features on the screen.

✓ **Highlight** the presence of digitized documents on the site with the use of a graphical icon, not unlike the way an icon is used for Adobe Acrobat files.

✓ **Increase awareness** by publicizing on organization listservs, at conferences, in colleges and universities, and on the Internet (e.g., Google search results, link in Wikipedia entries).

Following are profiles of those who participated in the Profiles in Science online focus groups.

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Appendix: Participant Profiles (Historians/Researchers)

#	Name	Age	City, State	Occupation
1	Barbara	50	Rye, NY	Archivist
2	Caroline	64	Baltimore, MD	Historian of medicine
3	Cecile	60	Apalachin, NY	Independent scholar focusing on race, gender, social change and medicine; P/T teacher
4	Hannah	40	Los Angeles, CA	Historian/Anthropologist; Associate Professor at UCLA
5	Marcia	58	Los Angeles, CA	Historian of medicine; UCLA research faculty director
6	Melanie	50	St. Paul, MN	Research scientist, MN Department of Health
7	Pankaj	24	Baltimore, MD	Neurodevelopment research assistant, University of Maryland School of Medicine
8	Sharon	62	Denver, CO	Life Care planner/Researcher

Appendix: Participant Profiles (Health Professionals/Scientists)

#	Name	Age	City, State	Occupation
1	Amanda	25	Elverta, CA	Autism behavioral therapist
2	Betty	35	Voorhees, NJ	D.O./Ph.D. student
3	Danielle	32	Denver, CO	Physician, starting surgical residency this June, Mayo Clinic Hospital
4	Gabriel	31	Philadelphia, PA	Physician, Thomas Jefferson University Hospital
5	Hanna	26	Baltimore, MD	Senior program coordinator
6	Maribeth	26	Champaign, IL	M.D./Ph.D. student, Community Health
7	Maxine	37	Middlebury, VT	Naturopathic physician and medical writer
8	Rob	41	Berkeley, CA	President, Health consulting firm
9	Vitaly	30	Champaign, IL	M.D./Ph.D. student, Immunology

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Appendix: Participant Profiles (Students)

#	Name	Age	City, State	Occupation / Area of Study / School
1	Cormac	32	Columbus, OH	Ph.D. student, Digital Media Studies, Ohio State University
2	Elizabeth	30	Arlington, VA	Medical student, George Washington University
3	Jeremy	36	Washington, DC	Graduate student, Physiology, Georgetown University
4	Kate	22	New York, NY	Pre-med student, Columbia University
5	Mordechai	27	Boston, MA	Medical student, Harvard Medical School
6	Polina	20	Warminster, PA	Neuroscience pre-med student, Temple University
7	Shira	30	Boston, MA	M.D./Ph.D. student, Epidemiology and Informatics, University of Massachusetts

Appendix: Participant Profiles (Educators/Librarians)

#	Name	Age	City, State	Occupation
1	A'Llyn	35	Boston, MA	Education and Information librarian
2	Anny	35	Los Angeles, CA	High school teacher / Science mentor
3	Claire	53	Tampa, FL	Medical librarian (Director of Medical Library, Shriners Hospital for Children)
4	Debbie	61	Asheville, NC	Medical librarian (Health Sciences Library, Mountain Area Health Education Center)
5	Dotty	55	Lonoke, AR	Medical librarian (Central Arkansas Veterans Healthcare Administration)
6	Joyce	56	Cleveland, OH	Medical librarian and CME liaison (Euclid Hospital - part of the Cleveland Clinic Health System)
7	Melanie	55	Portland, OR	Medical librarian