

Propelling Young Women into the Cyber Age: Gender Considerations in the Evaluation of Web-Based Information

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This paper discusses the results of a Douglass Project for Rutgers Women in Math, Science, and Engineering research grant titled "Leading Young Women to the Sciences and Technology," founded by the Toyota USA Foundation. The project resulted in the creation of the Gender-Based Web Site Evaluation Model for selecting Web sites of high interest to young women. The model includes eight evaluation criteria related to gender: social connectivity, flexibility and motility, contextuality, personal identification, graphic and multimedia concentration, collaboration, inclusion, and confidence. To develop this model, the project investigator analyzed related literatures, created a working model, tested the working model using group interviews with adolescent females, analyzed the group-interview transcripts using iterative pattern coding for qualitative data (Miles and Huberman 1994), presented the working model and data-analysis results to an expert panel, and subsequently created a revised model. The revised model and a list of questions to assist adult intermediaries in selecting Web sites for young women are presented and discussed.

For many years now, women have held a minority of the high-status, high-salary jobs in computer- and technology-related fields (Comber et al. 1997; DeRemer 1989; Dorman 1998, Gorriz and Medina 2000). Various factors account for women's underrepresentation in these professions, including adolescent girls' generally less frequent use of computer games, which are primarily targeted at male audiences; adolescent girls' consequently reduced levels of computer confidence; and young girls' gradual loss of interest in computers as they mature (Comber et al. 1997).

Another major cause of young women's lower participation in computer- and related- technology fields is that interface designers generally do not understand young people's experiences and perspectives. As Laurel (1990) explained, user-centered examinations of youth computer use are sparse. Druin (1999) echoed this plea for more youth user-centered usability studies. The result is computer software, Web sites, and other electronic information resources of limited interest to young people, including girls.

In response to women's underrepresentation in technology professions, Douglass College's Douglass Project for Rutgers Women in Math, Science, and Engineering [1] and the Girl Scouts of the USA secured a grant from the Toyota USA Foundation. Part I of "Leading Young Women

to the Sciences and Technology” sought to develop institutes, materials, and other methods for encouraging adolescent women to enter computer, science, and technology fields.

Part II of this project sought to work toward redressing the lack of youth user-centered computer-use studies. This paper discusses the second part of the grant work, for which the project investigator conducted all of the research, including the analysis of related research literatures, creation of the model proposed in this paper, collection of data through group interviews, analysis of the data, and presentation of the research findings to an expert panel. The final project report for this research, as well as links to numerous Web sites that typify the various criteria in the Gender-Based Web Site Evaluation Model, can be found on the [Girlstech Web site](#).

Literature Review and Analysis

A sizeable body of research has examined the relationship between gender or sex and the use of technology.[2] The major studies in this area come from various disciplines, including library and information science, cultural studies, critical theory, and gender studies. Analysis of these studies indicated that gender exerts a strong influence on young women’s Web site information selection and evaluation. Together these studies point to seven main electronic information preferences for young female users: collaboration, social connectivity, flexibility and motility, inclusion, contextuality, personal identification, and graphic and multimedia concentration.

Collaboration

The most commonly discussed gender-specific aspect of information-seeking behavior is collaboration. In general, women tend to prefer learning through collaboration; men generally prefer learning through competition (Brunner et al. 1998; Burdick 1996; Martin 1998; Mayberry 1999; Miller et al. 1996; Seymour and Hewitt 1997). As Seymour and Hewitt found in their interviews with undergraduate science majors, many young women find competition-based learning repellent: “As [the students’] comments indicate, most women prefer not to see learning turned into a competitive activity—indeed, they tend to view competition as getting in the way, both of good learning and of good collegial relationships” (264). In general, the literature suggests that adult intermediaries select resources that encourage collaboration when choosing information resources for young females.

Social Connectivity

Many studies have found that women tend to value computers for their ability to connect them with other human beings and as tools that facilitate communication with other humans (Brunner et al. 1998; Honey et al. 1991; Schofield 1995; Subrahmanyam and Greenfield 1998; Turkle 1988). These studies have also shown that women are more apt to respond positively to information presented in terms of human relationships than to information presented for information’s sake alone. Conversely, Turkle found that men tend to view computers as tools, valuable and impressive as examples of technological power. Based on past research, this desire for social contact seems to be a significant difference in women’s and men’s preferred uses of technology.

Flexibility and Motility

Next, some women dislike computers based on a belief that there is just one “right way” of doing things in the digital world (Brunner et al. 1998; Miller et al. 1996; Roychoudhury et al. 1995; Turkle 1988). This gender-based attitude surfaces in women’s and men’s evaluation of computer software. In general, women “are drawn towards a style of programming . . . best characterized as . . . a relational encounter. . . . It is marked by an artistic, almost tactile style of identification with computational objects, a desire to ‘play with them’ as though they were physical objects in a collage” (Turkle, 50). Many men, on the other hand, tend to prefer a risk-taking style “characterized by testing the limits of both machine and self through mastery and manipulation of the computer environment” (47).

Miller et al. (1996) found that the young women they interviewed in focus groups did not desire closure of a section of a computer game before moving onto another game or segment of a game. They seemed to prefer moving freely among environments without “completing” or winning one. The contrasting paradigm—that players will continue until they win or move to the next level—which usually appears in popular gaming software, was not observed at any of the sessions (31).

Consequently, young women are likely to prefer Web sites that have multiple possible paths and many correct answers to questions and problems posed.

Inclusion

Past research has shown that the illustrations and photographs in most science and technology texts show many more male scientists than female scientists (Schofield 1995; Walford 1981). Similarly, the contributions of female scientists have largely been excluded from written histories (Harding 1991).

To express the idea that all young women, and all young people, can become scientists, it is proposed here that Web sites should depict roughly equal numbers of women and men, as well as people from many racial and ethnic groups, in positions of status and leadership in science and technology. There is no indication in the literature, however, that young women prefer inclusive sites; inclusion is suggested as a prescriptive selection recommendation.

Contextuality

Research has also indicated that young women tend to perform better on school assignments when lessons and problems are introduced in context (Honey et al. 1991; Lage and Treglia 1998; Scaife 1998). That is, young women are likely to understand better the process through which a refrigerator chills foods from a narrative describing a restaurant refrigerator and its role in preserving foods for customers than from a diagram that depicts the inner workings of that same refrigerator. Women of all ages also tend to prefer information presented within a narrative, a format that supports contemplation and interpretation. Men of all ages tend to prefer information presented in a more rigidly structured framework or a format ideal for ready analysis. Again, this is a major difference in women’s and men’s digital-information preferences.

Personal Identification

A considerable amount of research indicates that young women learn more when they can relate lessons and problems to their personal lives (Miller et al. 1996; Roychoudhury et al. 1995; Subrahmanyam and Greenfield 1998). Young women seem to engage more when they see some aspect of themselves, such as a protagonist of a similar age or geographic region, reflected in an information resource. A derivative concept is that many young women learn best through role-playing, which allows them to use their imaginations to experience an unfamiliar lifestyle. Thus young women are likely to prefer sites strong in the area of personal identification.

Graphic and Multimedia Concentration

Lastly, research shows that young people, regardless of gender, prefer Web sites with large amounts of high quality graphic and multimedia content to plain-text sites (Fidel et al. 1999; Kafai and Bates 1997; Wolcott 1998). In each of these studies, young Web users tended to view text-only sites briefly, rapidly moving on to sites with more drawings, photographs, and audio and video clips and to sites with heavy use of multiple colors. For most young women, the quality and amount of multimedia content are exceptionally important in maintaining their attention and interest (Miller et al. 1996), indicating that Web site–graphic and multimedia quality is of even greater importance to juvenile female users than to juvenile male users.

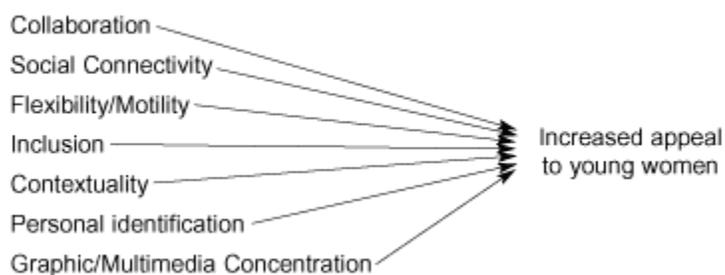
Method

A condensed discussion of the study methods follows. For a more detailed description, see Agosto (2001).

Working Model

Next, the project investigator organized the seven gender-based Web site evaluation criteria, derived through the literature review and analysis phase described above, into a working model (see figure 1).

Figure 1. Working Model #1: Gender-Based Web site Evaluation Criteria



Group Interviews

The next step in the research process involved the use of group interviews to test the validity of the working model. In contrast to individual interviews, group interviews involve the simultaneous interviewing of multiple-research study participants. Group interviews differ from focus-group interviews in that a major goal of focus group interviews is to achieve group consensus, whereas this is not a goal of group interview research (Frey 1991). The consensus-building process in focus-group interviews can serve to thwart minority opinions, falsely indicating that all members of a focus group agree with the majority opinion. Group interviews were chosen over focus-group interviews to enable minority, as well as majority, opinions to emerge.

The group-interview participants were 33 14- and 15-year-old females attending hands-on leadership, science, and technology workshops sponsored by the Douglass Project. They were New Jersey high school students with a range of academic-achievement levels who had applied for the Douglass Project programs on a volunteer basis. Each interview involved between 5 and 11 research participants and lasted between 45 and 60 minutes. Before the interviews, the participants spent 50 minutes in the Douglass Project computer lab examining a set of seven test Web sites:

- [Hurricane Hunters.com](#) takes users on a multimedia meteorological data-gathering flight into the center of a hurricane.
- [The Boston Museum of Science](#) site includes information about the museum, as well as a series of online exhibits.
- [NASA's Solar System Simulator](#) produces realistic images of a number of planets and satellites at any date, time, and viewing angle the user desires.
- [The Exploratorium's Sheep Brain Dissection Exhibit](#) uses text, pictures, and videos to present an actual sheep brain dissection.
- [Topo Zone](#) generates U.S. topographical maps in various magnifications and sizes.
- [Biographies of Women Mathematicians](#) includes pictures and biographies of hundreds of female mathematicians.
- [PBS's Doctors over Time](#) uses interactive Shock Wave technology to show how a doctor working in 1900, a doctor working in 1950, and a doctor working in 1998 would diagnose and treat three different medical ailments.

The interviews were loosely structured and inductive in nature. The project investigator asked the study participants three questions about each of the test sites: “What did you like about the site? What didn’t you like? What would you change if you could make changes?” The project investigator also used probe questions to test any proposed evaluation criteria that the participants did not discuss on their own. The interviews were audiotaped.

Data Analysis

The project investigator fully transcribed each group interview tape into word processor form. She then used iterative pattern coding to analyze the data (Miles and Huberman 1994).

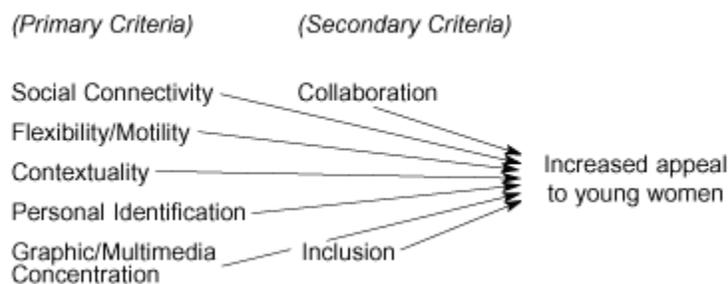
Iterative pattern coding (alternatively called the “cut-and-paste technique” (Stewart and Shamdasani 1997), “making thematic connections” (Seidman 1991), and “the analysis of

qualitative interviews” (Wester 1996)) is the most common form of qualitative data analysis. It involves iterative readings of qualitative data while searching for recognizable data patterns.

Data units identified as belonging to emerging data patterns are then aggregated into thematic groups. Each group is given an initial code that describes it. Initial codes are called “pattern codes” (Miles and Huberman 1994), or “open codes” (Wester 1996). Coding may take several passes as categories evolve and as the coder builds a deeper understanding of the data. The finalized codes become the basis for model building and for the data report.

For the current study, the data fell into seven pattern codes, one for each of the proposed gender-based Web site evaluation criteria: collaboration, social connectivity, flexibility and motility, inclusion, contextuality, personal identification, and graphic and multimedia concentration. However, the levels of support for these seven pattern codes varied. Support for five of the criteria (social connectivity, flexibility and motility, contextuality, personal identification, graphic and multimedia concentration) was strong. For the remaining two criteria (collaboration and inclusion), support was either weak or mixed. This necessitated the arrangement of the pattern codes into two groups of finalized codes, primary evaluation criteria (the pattern codes receiving strong support) and secondary evaluation criteria (the pattern codes receiving weak or mixed support). Discussions of the data in relation to each of the seven finalized codes follow, with short interview transcript excerpts to illustrate each code. The division of the seven working evaluation criteria into primary and secondary categories necessitated revision of the working model. The revised working model (figure 2) reflects these two levels of evaluation criteria.

Figure 2. Working Model #2: Gender-Based Web site Evaluation Criteria



Primary Evaluation Criteria

Social Connectivity

The Douglass project group interviews lent strong support to the concept of social connectivity. Overwhelmingly, the participants’ favored use of the Web and Internet was for sending and receiving email, with chat-room use being the second most popular pursuit.

Even in the case of playing computer games, the study participants expressed a desire to establish contact with other human beings. The young women enjoyed using computers to play games, but they preferred live opponents to solitaire games or to computerized opponents. One

component of the test site HurricaneHunters.com was the “cyberflight,” which takes the user along on a flight into the center of a hurricane through text, photographs, and video clips. The participants found the flight to be dull and would have much preferred it had it enabled some form of contact with live humans:

Participant 1: “It would be good if you could play [the cyberflight] against other people, that are online.” [3]

Participant 2: “Yeah.”

Participant 3: “Yeah, like if you go to the Jeopardy Web site, and if you register you can play against other people.”

All of the study participants in the particular interview excerpted above became extremely excited at the prospect of playing a Web-based game against live people. Their interest in game-playing was more as a method of making human contact than for the purpose of winning games.

Flexibility and Motility

The participants also expressed preferences toward flexibly structured Web sites. Of the Web sites that they evaluated in the Douglass Project computer lab, their favorite was a fully flexible, noncompetitive coloring book site. (Coloring.com was not one of the test sites selected for evaluation. The participants located it through a link from one of the test sites, and they chose to evaluate it in addition to the text sites.) Coloring.com allowed them to select their own paths to travel through the site and did not require completion of any one section before moving to another.

The study participants’ Web site preferences also supported the concept of motility. When discussing the HurricaneHunters.com cyberflight, the study participants expressed shared discontent that the site did not enable them to direct the path of the plane:

Participant 1: “When they said you’d go on a ride, I thought you’d actually be moving, but it was actually just clicking.”

Participant 2: [Indicating distaste.] “Ew.”

Participant 3: “It would have been better if you were flying the plane.”

Participant 4: “Yeah!”

Participant 5: “When it said ‘cyberflight,’ I thought you were actually going to go on a flight, where you could kind of control it—”

Participant 6: “That’s what I was thinking!”

Participant 4: “Oh! That would have been *really* cool!”

As the participants discussed their desire to control the plane, many of them gesticulated as if they were flying an airplane, indicating their desire to have tactile contact with the imaginary plane's controls.

Contextuality

Again, data from the group interviews strongly supported this evaluation criterion. For example, the participants preferred HurricaneHunters.com to the Women of NASA based on contextuality:

Interviewer: "The hurricane site had a story when you're following in the airplane and the NASA site was straight information, biographies. Do you have a preference?"

Participant 1: "I like the hurricane one better. I don't like straight information and stuff, it's not good—"

Participant 2: "It's really boring—"

Participant 3: "It's just going on and on about stuff and having a picture."

Various young women: "I know! Yeah!" [Many other indications of agreement.]

Participant 4: "[The story] made information and stuff not boring."

Even those participants with limited interest in meteorology were interested in the story structure of this site.

Similarly, although all four groups evaluated the test site Biographies of Women Mathematicians negatively overall, they did like the fact that it included the stories of the mathematicians' whole lives, rather than just listing facts about their math careers. As one participant explained: "When you went into the people['s biographies], you got their whole life history. Not only just what they did to become a mathematician." This widespread interest in contextuality indicates that Web sites that provide information within story contexts are more likely to appeal to young women than are uncontextualized sites.

Personal Identification

The concept of personal identification also generated a great deal of interest and support. For example, the participants agreed that the Women of NASA site was dull because they lacked personal connection to the subjects of the biographies:

Participant 1: "The women [of NASA Web site] was always boring. It gets tiring; it gets old and boring, repetitive."

Participant 2: "You don't really know the people and it's just going on about them and having their picture and it just has all this stuff about them and—"

Participant 3: "If one of the NASA women was my mom or something like that, I'd be, like, 'Oh, my God!'"

Participant 1: “It’d be more interesting.”

After this last comment, the other young women in the group interview became excited at the prospect of reading an online biography of someone they actually knew, serving as strong proof of their preference toward sites with personal connectivity.

Graphic and Multimedia Concentration

Data from the group interviews indicated that to many of the participants, graphic and multimedia concentration was the single most significant factor in their rating a Web site positively or negatively. In all four interview groups, the young women spent more time discussing their opinions of the graphics, videos, audio clips, colors, fonts, and so on, than any other aspect of the Web sites they evaluated. For example, in discussing her first impressions of the Women of NASA, one young woman said, “I have a thing about colors and I liked the green background.”

This comment initiated a long and intense discussion of whether or not the particular shade of green of the background was attractive, with almost all of the young women in the group passionately arguing for or against the color. The participants disagreed as to whether the background color was attractive or not, but they agreed that it formed a major part of their overall evaluation of the site. Although personal color and design preferences varied from young woman to young woman, this study indicates that the importance of Web site multimedia quality and quantity to young women cannot be overstated. As one participant concluded, “The page has to be inviting—for you to be able to look at it again and again.”

Secondary Evaluation Criteria

Collaboration

The first of the two secondary evaluation criteria received mixed support in the group interviews. The participants devoted a considerable amount of time to discussing the merits of using the Web with a partner or partners versus working alone. In affirmation of past research findings, they agreed that they generally preferred to work collaboratively when using computers for homework purposes. The following interview transcript serves as an example of support for collaboration in relation to homework:

Participant 1: “I think that anything that deals with school and learning is easier to do with another person.”

Participant 2: “Yeah, because you have the same objective.”

Participant 3: “Right. You’re looking for the same thing.”

Participant 4: “And it’s fun. You feel like part of the same thing and can make jokes and stuff.”

The participants preferred working with someone else when working on homework assignments because their interest in a query that someone else had created was often lower than in self-generated queries (Gross 1997; 1999) or in tasks that they had created for themselves. Their enjoyment of the other person could compensate for their lack of interest in imposed queries (1997; 1999), or in tasks that another person created, such as homework assignments. As a result, when selecting homework-related digital resources for young women, adult intermediaries should keep in mind that resources not based on competition are preferable to those that present information through competitive formats, such as scored quiz games.

However, participant preference for collaboration was restricted to school-related activities. The participants stressed that they preferred working collaboratively in educational settings and for school-related work, but that they generally preferred working alone in leisure pursuits, such as reading e-mail and playing computer games. Privacy is partly the cause of this preference for working alone on self-generated queries. The participants' most frequent reasons for using the Internet and the Web were for e-mail and chat-room use, and when engaging in these forms of private communication, they preferred working singly. As one participant explained, "If you were just going on for your own use, you were just interested in something . . . you wouldn't want someone looking on with you, like at your mail."

The participants also enjoyed direct competition in online games for leisure use, such as playing Jeopardy online. It may seem that this enjoyment of competition contradicts past studies that found young women to prefer working collaboratively in digital environments (i.e., Brunner et al. 1998; Burdick 1996; Martin 1998), but each of these past studies examined young women's digital resource use preferences exclusively in regard to imposed queries. The current study supports young women's preference for collaboration in regard to imposed queries, but it does not support it in regard to self-generated queries.

As a result, it is important that Web sites selected for school and educational use support collaboration, but Web sites selected for leisure purposes need not be collaborative to hold young women's attention. Because of this mixed preference for and against collaboration, it appears in working model 2 as a secondary evaluation criterion.

Inclusion

The remaining secondary evaluation criterion received less attention in the group interviews. Although some of the study participants did claim that inclusion was important in their evaluation of Web sites, as a whole, they felt that this criterion was of secondary significance. A few study participants claimed that the one redeeming aspect of the Women of NASA Web site, which they felt was otherwise unbearably dull, was its feminist aspect. As two of the members of one group said:

Participant 1: "I like that it showed that women can get this high and stuff. It sets a good example."

Interviewer: "The inspiration?"

Participant 2: "Right. I was just going to say that."

Other participants mentioned that the test site *Doctors over Time* showed sex roles changing, with a male doctor in 1900 and a female doctor in 1998. Some found this feminist attribute to be exciting and empowering. For example:

Participant 1: “There’s one point that I really liked. In the past they had a male doctor with a female assistant, and in the most recent date they had female doctor.”

Participant 2: “Yeah.”

Participant 1: “That was a good part that I really liked.”

Participant 3: “That was really good. A male doctor and a female doctor.”

Participant 4: “It shows how far women have come over time—”

Participant 1: “We’re overtaking—[laughs]”

Participant 4: “Before you would never think of a woman doctor. Only assistants or nurses, and now women can be whoever they want. They can be doctors, whatever.”

Other participants were less enthusiastic about this feminist aspect of the site. They found the *Doctors over Time* sex-role change to be interesting but not particularly significant. As one young woman explained: “If [the site] has something to do with gender, like role changes, yeah, I can understand if they actually depict that. Otherwise, it doesn’t really matter to me.” Others felt that the sex-role change was “nice” but “not too important.” Due to this mixed level of support, inclusion is a secondary evaluation criterion in the model.

Despite the participants’ limited interest in inclusion, it is an important evaluation criterion for adult intermediaries to consider when selecting Web sites for young women. It is important to find inclusive resources for prescriptive reasons, since such resources can bolster young women’s feelings of assurance and self-worth in digital environments, even though inclusion is not a digital-resource characteristic that they strongly prefer.

Revised Working Model

At this point in the research process it was necessary to revise the working model to reflect the two levels of Web site–evaluation criteria detected during data analysis.

In this revised working model (see figure 2), the seven evaluation criteria fall into two categories, primary and secondary gender-based Web site–evaluation criteria. Those criteria that received strong support in the data appear as primary criteria; those that received either mixed or weaker support appear as secondary criteria.

Presentation to Expert Panel

After revising the initial working model, the project investigator presented it, along with a detailed explanation of the data-analysis process and with data samples relating to each of the gender-based Web site–evaluation criteria, to an expert panel. The panel included two professors

from the Rutgers computer science department, two professors from the Rutgers School of Communication, Information and Library Studies, two regional directors of educational technology for New Jersey secondary schools, the director and assistant director of the Douglass Project, and two program directors from the Girls Scouts of the USA national headquarters. Each panel member had expertise in technology issues as well as experience in working with juvenile computer users.

The panel offered overwhelmingly positive feedback for the working model, indicating that all seven criteria conformed with their own observations of young women's digital information preferences. They also suggested that an additional evaluation criterion be added to the model. The panel members felt that one of the main reasons that young women rarely consider computer-related careers is that they lack self-confidence in their computer abilities, whether or not they lack related competence. Adding confidence to the model, they argued, would help adult intermediaries to locate Web sites that could work to combat this career-goal disincentive.

Subsequent reanalysis of the literature lent further support to confidence as a gender-based Web site–evaluation criterion. From her interviews with highly educated, intelligent women who were reluctant to use computers, Turkle (1988) concluded that “The central issue for these competent and talented women is not phobia or lack of ability, but a reticence to become more deeply involved with an object experienced as threatening” (46).

Similarly, Opie (1998) traced girls' reduced levels of confidence with computers to their lesser-developed technological skills. Comber et al. (1997) traced these reduced levels of computer confidence to adolescent women's less frequent use of computer games, the majority of which are designed for and marketed to males. Based on the literature, it seemed that Web sites that offer strong encouragement and support could indeed be used to help counteract this gender-related self-doubt.

In contrast, reanalysis of the group-interview data indicated that the participants were relatively indifferent to confidence as a Web site–evaluation criterion. Participants in only one of the four group interviews discussed any related ideas in the following short conversation concerning the Women of NASA site:

Participant 1: “[I liked] the teen-friendly vocabulary.”

Participant 2: “Oh, that's right.”

Participant 3: “They had good language.”

Participant 2: “That's right.”

Participant 3: “Understanding of us.”

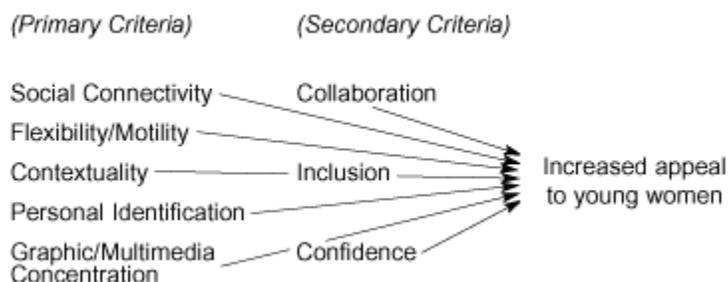
The Revised Model

In accordance with the panel's suggestion, the project investigator revised the working model to include confidence. Even though data reanalysis indicated that the participants expressed minimal interest in Web sites with strong confidence, confidence was added to the model as an

important prescriptive–evaluation criterion. That is, confidence is a useful selection criterion for finding digital resources that might bolster young women’s comfort levels with technology, but it is not an evaluation criterion for which the participants expressed strong preference. It is consequently a secondary evaluation criterion in the final revised model.

With the addition of confidence, the final revised model contains eight evaluation criteria (see figure 3).

Figure 3. Gender-Based Web site Evaluation Model



Suggestions for Practitioners: Evaluation Questions

As discussed above, the goal of this research was to discover what aspects of Web sites are most likely to attract and repel the greatest numbers of young women. Based on the study findings, the project investigator sought to create a tool for facilitating the selection of Web sites that can increase young women’s interest in Web use. It is hoped that with increased interest in the use of Web technology, young women will be more open to viewing themselves as potential computer scientists, engineers, and technology experts and thus be more likely to enter these careers. The Gender-Based Web Site Evaluation Model presented above (also available on the [Girlstech Web site](#)) can serve as one such tool for selecting Web sites of increased interest to juvenile females. The appendix presents an additional tool in the form of a list of evaluation questions for adults to consider when selecting Web sites for young women. Teachers, library media specialists, and other adult intermediaries can use these questions to clarify the application of the Gender-Based Web site Evaluation Model to Web site selection. Two or more selection questions for each evaluation criterion are provided.

Conclusion

The Gender-Based Web Site Evaluation Model was designed to target Web sites and other digital-information resources of high interest and high appeal to young women. It is important to understand that its use will identify resources likely to appeal to *most*—not *all*—young women, because not all young women exhibit identical Web site preferences. Although it is understood that electronic-information preferences vary among young women, the goal of this research was to discover what aspects of Web sites are most likely to attract and repel the greatest numbers of young women. As Cassell and Jenkins (1998) explained, to assert that all young women share the same preferences and wants is artificial but necessary: “Despite the clear dangers of such

‘sweeping generalizations,’ the ability to determine what girls want may seem necessary at a time when we are trying to open up a space for girls to participate within this medium at all” (25). Therefore the use of the model in selecting Web sites will result selections likely to appeal to most, but not all, young females.

Not only do women continue to represent a minority of the high-salary, high-status jobs in computer-related fields, research indicates that fewer and fewer young women are completing bachelor’s degrees in computer science (Gorritz and Medina 2000). One method of combatting this trend is for library media specialists, teachers, and other adult intermediaries to select digital information resources using the model and evaluation questions proposed in this paper.

Of course, the selection of digital resources with increased appeal to young women is only one way of making science and technology fields more appealing career options for young females. The selection of such resources can help to ease the science and technology gender gap; it cannot completely eliminate it. Other methods of increasing young females’ interest in technology are also important, such as working to ensure that female and male youth use technology at equal rates at school and at home. *Gender Gaps: Where Schools Still Fail Our Children* (American Association of University Women 1999) warned that females are not participating in computer-science education at rates equal to males. The study stated that in 1995 and 1996, for example, females comprised just 16% of the advanced placement computer science test-takers. Teachers and other educators must encourage female students to take computer-science courses at rates equal to male student–participation rates.

It is also important for adult intermediaries to observe and guide young people in their use of technology. In the school library media center, media specialists are in an ideal position for observing gender differences in student computer use. In cases in which male students dominate, media specialists can seek to equalize computer utilization by testing different use patterns until a successful pattern is found. Two possible use patterns to test include dividing class periods in half into “females’ time” and “males’ time” for the computers, and pairing females with females and males with males at computers, instead of allowing mixed-gender groups, in which males often dominate computer use. No single-use pattern is best for all student groups; experimentation with these and other patterns is necessary to find the optimal pattern for any particular student group or mixed-sex setting.

It is hoped that through methods such as these and through the Web site evaluation model and selection questions offered in this paper, young women will gain valuable computer skills and increased self-confidence in their computer abilities, helping them to view themselves as potential computer scientists and engineers in our ever more technology-driven world.

References

1. Douglass College is the women’s undergraduate unit of Rutgers, the State University of New Jersey.
2. It is important to differentiate between the terms “sex” and “gender.” Sex is biologically determined and dichotomous; gender is primarily socially constructed and continuous. That is, genetic makeup determines whether a person is a woman or a man, but societal conditions result in a person’s acquisition of gender-specific (feminine or masculine) traits in varying degrees. Thus, not all young women and girls share the same gender-

based characteristics of interaction with electronic information. But, in view of the fact that more girls and young women exhibit feminine traits than do boys and young men, identification of gender-based, information-interaction characteristics can lead to the design of electronic information resources that are generally more interesting, user-friendly, and enjoyable to young women and girls than are the majority of existing electronic information resources, which have traditionally been designed for and marketed to boys and young men.

3. All transcript quotes are verbatim with the exception of the removal of some occurrences of the words “like,” “you know,” and “um” for greater readability.

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Appendix

Social Connectivity

1. Does the resource emphasize the importance of its topic matter to human relationships?
2. Is there a method for contacting other people, such as a chat room for speaking to experts or an e-mail address for obtaining further information?
3. Does the Web site enable live interaction with other users in different locations?

Flexibility and Motility

1. Do questions and problems in the site have multiple correct answers?
2. Does the Web site allow users to select from numerous navigational paths?
3. Does it allow users to rearrange the physical placement of objects on the screen?
4. Does it encourage and reward multiple-use styles, as opposed to extracting penalties for selecting incorrect choices or paths?
5. Does the Web site support fluidity and exploration?

Contextuality

1. Are information contexts (histories, stories, explanations, backgrounds, etc.) emphasized?
2. Is information presented in story format, as opposed to isolated facts, figures, charts, and graphs?
3. Does the Web site encourage contemplation and interpretation?

Personal Identification

1. Is it likely that most young women would find a connection between their personal lives and the context of the Web site?
2. Does the site encourage role-playing?

Graphic and Multimedia Concentration

1. Is there a relatively high percentage of graphic and multimedia content throughout the various parts of the site?
2. Are the graphics clear and easy to understand?

3. Are the audio and video components high quality?

Collaboration

1. Does the Web site encourage exploration and inductive learning rather than emphasizing competition and winning (for imposed query use)?

2. Does it lend itself easily to small-group use (for imposed query use)?

Inclusion

1. Are women and men represented in roughly equal numbers in narrative, graphic, audio, and video content?

2. Are people of diverse racial and ethnic backgrounds depicted?

3. When women and members of marginalized groups are represented, are they presented in positions of respect and influence?

Confidence

1. Does the site use a tone of respect in regard to users' abilities instead of presenting itself as exclusively authoritative?

2. Does it encourage learning rather than implying that the user should already be proficient in the subject matter?

3. Above all, does the site support and nurture young women's confidence in themselves and in their abilities?

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