gender chip the project

Action Toolkit

a project of **Media Working Group**

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Note: Throughout this document, we use the acronym **STEM** to refer to "science, technology, engineering and math."

from the filmmaker **helen de michiel**

Forward, backward and spiraling – it takes a thousand steps or more to become an engineer, mathematician or scientist. For every new generation, it takes key movements along the way to make the leap into professional adulthood.

How do some women do it? What are their college years in-training like? And how does gender cross with our cultural assumptions of success and failure in the high-stakes professions of science, technology, engineering and math (STEM)?

When I began working with a group of young women at Ohio State University in 1997, I had so many questions about how they would navigate through their STEM training. It was the late 90s, and everything seemed possible as new technological vistas opened up daily. The high-tech bubble had begun to inflate, young college grads flocked to IT jobs, the number of families to own a home computer skyrocketed, and there was increasing discussion about the digital divide. Where were women's voices going to develop in this new burst of the digital age?

Though women comprise the majority of undergraduates in America, only 20% are earning degrees in engineering and computer science. Opportunities for workers in STEM fields are expected to increase by 5.6 million by 2008, yet only 11% of the science and engineering workforce is comprised of women. Representing 50% of the available talent pool, women need to be both centrally involved in shaping new areas of research and technology, as well as advocating for change around the balancing of workplace and family issues.

When the Wexner Center for the Arts at Ohio State invited me to create a documentary following students who would graduate in 2001 as the first class of the new century, I was eager to organize a group from the technological and scientific fields. We created the Gender Chip Project, and a four-year long conversation was born. Our group of undergraduate women came together consistently over their college years to capture the experiences of STEM education for young women as they transition and grow into young adulthood.

The film has become a catalyst to expand the dialogue around these issues. In collaboration with Media Working Group, we are building a multimedia package of tools and resources that aims to encourage girls and young women to pursue careers in the STEM fields, and to provide training and support to the adults who mentor them. Through screenings and broadcasts, and workshops and training sessions led by Active Voice, we hope that the stories of the five students in Ohio will trigger conversation and awareness in schools, companies, organizations and colleges around the country — and that they will inspire action for improving the STEM landscape for future generations of women coming up.
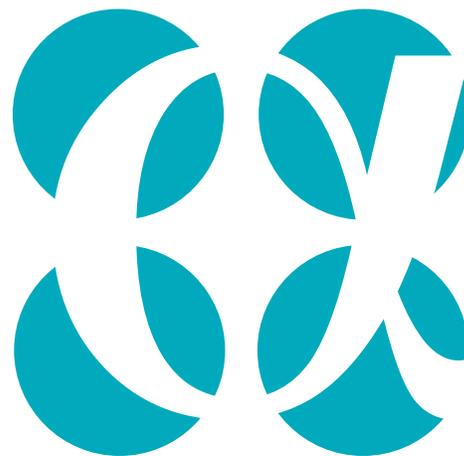
to use the *how* **action toolkit**

using excerpts

If you have limited time, or would like to sharpen the focus of your discussion, you may consider showing excerpts from *The Gender Chip Project*. The film is comprised of three chapters, and each works well on its own. Instructions for using the individual chapters can be found on the following pages:

The Action Toolkit serves as a companion to *The Gender Chip Project* documentary. It was designed for groups and individuals that want to use the film to:

- Provide information, training and support to teachers, counselors and practitioners who serve girls
- Increase the number of girls and young women who pursue and succeed in STEM fields
- Support and encourage girls and young women at all stages of their pursuit
- Engage professional women as mentors and role models for girls and young women

In addition to discussion questions, resources and action steps, this guide includes suggestions for using *The Gender Chip Project* with three broad groups:

- **Schools and nonprofits:** Helping adults recruit, prepare and retain girls in STEM courses, after-school programs and extracurricular opportunities
- **Young women:** Creating support networks for high school, community college and university students who are pursuing STEM courses of study
- **Professionals and Advocates:** Inspiring professional women and other stakeholders to serve as role models and improve the STEM opportunities for the next generation

making effective use of the film

By providing an intimate glimpse into the lives of real people, this documentary film provides a perspective often not found in mainstream media, and it allows viewers to personally connect to an issue that might otherwise seem distant or abstract. The compelling narratives of the students featured in *The Gender Chip Project* unearth a number of important questions concerning young women's involvement in STEM. The moving accounts of their trials and triumphs also have the potential to open the hearts and minds of viewers — and move them to action. We've listed some suggestions for helping you get the most out of your screening.

- Immediately following the screening, allow participants to express their feelings about the film. It's a good idea to let people release their emotions or share strong responses up front. This clears the way for productive dialogue.
- Remind participants that the purpose of the session is not to critique the film – the film is the conversation starter, the springboard for the discussion and problem-solving you hope to accomplish.
- *The Gender Chip Project* contains many themes related to girls and STEM – the influence of parents and teachers, the experience of being a minority, the process of making academic and career choices, the challenge of balancing work and family, to name a few. So it's important to focus your discussion. Choose your discussion questions strategically and keep your audience on topic.
- If conversation strays, ask a question about the film to bring participants back to the topic at hand.
- Don't let your screening be a passing event! Make sure it concludes with a call to action, whether it's signing up professional women to be mentors, organizing an all-girl outing to a local technology company or research lab or forming a girls' recruitment committee at your school or after-school program.

To purchase a DVD or VHS copy of *The Gender Chip Project*, visit the Women Make Movies website **www.wmm.org,** call (212) 925-0606 x360 or email **orders@wmm.com**.
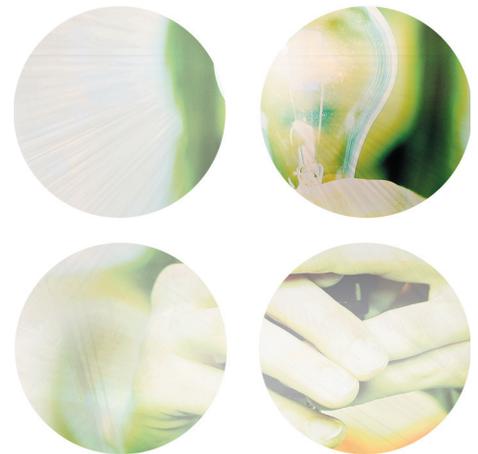
schools and nonprofits

Helping adults recruit, prepare and retain girls in STEM courses, after-school programs and extra-curricular opportunities

This section focuses on using *The Gender Chip Project* with the individuals – teachers, counselors, school administrators, parents and the staff of nonprofits and after-school programs – who have a direct and indirect impact on girls' and young women's choices regarding STEM. Following are some suggestions for using the film with these groups:

The Gender Chip Project provides free interactive curricula for a range of activities to support girls in their pursuit of education and careers in STEM. The curricula are designed for:

- 5th and 9th grade classrooms
- Girl-serving nonprofits, after-school programs and homework clubs
- Secondary counselors and advisers
- Post-secondary advisers
- General activities

www.genderchip.org

- Show *The Gender Chip Project* as part of a workshop on recruitment for teachers, counselors and/or nonprofit program staff. Share your school's or program's statistics for female enrollment in science, math and computer science courses, brainstorm ways to increase the numbers and get commitments from workshop participants to take on one or two recruitment activities.
- Organize a professional development session for teachers on creating gender-inclusive STEM classrooms. Open with a screening of the "Making Discoveries" section of the film. Follow with testimony from experts about teaching strategies that engage both girls and boys.
- Organize the above activity for teachers-in-training, graduate students in education or faculty and teaching assistants at universities.
- Set up a professional development session for teachers on how to use the film and the Gender Chip Project website and curricula.
- Host an open house for parents to inform them about their daughters' educational and economic opportunities in STEM. Use the film to encourage comments and discussion about how parents can support their daughters' pursuit of STEM. Present information on course offerings, college requirements and career prospects, as well as tips for encouraging their daughters' interests.
- Convene the nonprofit STEM programs in your area and use the film to create new opportunities for collaboration and coalition-building, share best practices and resources, etc.

discussion questions

- *The Gender Chip Project* identifies several reasons, including labor shortages and economic security, as to why it's important for women and girls to be involved in STEM. Which of these arguments did you find the most compelling? What are some other reasons for involving more women in science, technology, engineering and math?
- The young women in the film speak about childhood experiences that either supported or challenged their pursuit of STEM. Which of these stories resonated with you most? What are some of the other factors that influence girls' decisions to pursue or not to pursue STEM?
- In discussing her experience of being the only girl in her advanced math class in high school, Anna says, "I had to work twice as hard to prove myself." She had a similar experience in college. In the face of these challenges, what are some strategies for keeping girls on STEM tracks? Why do you think Anna stuck with her major in mathematics?
- In addition to the narratives of the five students, the film includes perspectives of Ohio State faculty and national experts on girls, women and STEM. How did this "plurality" of voices contribute to your viewing of the film? To what extent were they representative of the young women you know? What perspectives were missing?
- None of the young women in *The Gender Chip Project* discuss economics – either as a barrier or an incentive – as it relates to their pursuit of STEM. Think about the young people you work with. How might economics factor into their decisions about the future?

gender-inclusive classrooms

A gender-inclusive classroom uses teaching strategies that take into account diverse learning styles, recognizing that learning differences often fall along gender lines. Since teaching methods and curricula have traditionally been modeled on boys' learning styles, it's important to introduce strategies that also engage girls' needs and interests. Here are some ideas:

- Review your textbook and curricula for gender bias. If you notice that many examples are stereotypically male (rockets and other projectiles, explosions, sports, cars, etc.), try to include some examples that are either gender-neutral or that will be more likely to appeal to girls. The point here is not to reinforce gender roles – you just want to create a range of entry points for capturing students' interests.
- Make sure girls get enough "hands-on" time. Research shows that young women arrive at college with less hands-on experience than their male counterparts. This difference is attributed in part to the way girls and boys play. Girls' games are often relational (e.g., playing house) while boys are more likely to play video games and with toys that develop their spatial and hands-on skills.
- Encourage exploration and making mistakes. In the film, Amanda talks about how her brother always took things apart; but when she took things apart, she was made to feel like she was breaking an unwritten code. Girls are often socialized to "follow the rules," whereas boys are more likely to take risks and learn by doing. Try to create a classroom culture where risk-taking is valued and mistakes are okay.

Based on Donna Milgram's article, "Gender Differences in Learning Style Specific to Science, Technology, Engineering and Math," National Institute for Women in Trades, Technology & Science.

resources

- **Center for Women and Technology** www.umbc.edu/cwit/
  Through research, scholarships and educational programming, the Center works to achieve women's full participation in all aspects of information technology. Initiatives include the ESTEEM After-school Program, a partnership with the Shriver Center and the Chabot Space and Science Center that includes an after-school, weekend and four-week summer program for middle school students.

- **Expect the Best From a Girl: That's What You'll Get** www.academic.org
  Tips for parents for encouraging their daughters to enter traditionally male professions.

- **Exploratorium Teacher Institute** www.exploratorium.edu/ti/
  Offers a summer institute, new teacher program (for San Francisco Bay Area teachers only) and an array of online resources for science educators.

- **The Gender Chip Project** www.genderchip.org

- **ITest Learning Resource Center** www2.edc.org/itestlrc/newsletter/issue1.htm
  Project of the Educational Development Center with resources, research and national contacts for schools and educators working to increase the numbers of students in STEM careers.

- **National Girls' Collaborative** www.pugetsoundcenter.org/ngcp
  Focused on four regions (California, Massachusetts, Pacific Northwest, and Wisconsin), this project aims to strengthen girl-serving STEM programs through collaboration among organizations, institutions and businesses. Website includes program directories and links.

- **National Institute for Women in Trades, Technology and Science** www.iwitts.com
  National organization dedicated to helping women break into male-dominated fields. Web resources include strategies for recruiting and retaining women and girls in STEM courses and fields.

- **National Science Partnership for Girl Scouts and Science Museums**
  www.fi.edu/tfi/programs/nsp.html#top
  Collaboration between The Franklin Institute Science Museum in Philadelphia and Girl Scouts of the USA that seeks to increase opportunities for girls ages 6-12 to explore the knowledge and processes of science in a hands-on, exploratory, all-girl environment.

- **Science, Gender, and After-school** www.afterschool.org/sga/
  Interactive forum for researchers, practitioners, policymakers, parents and others interested in strengthening the role of after-school programs in increasing girls' participation in STEM education and careers. Includes publications such as "What We Know About Girls, STEM, and After-school Programs" and *Science, Gender, and After-school: A Research-Action Agenda*.

- ***Unlocking the Clubhouse: Women in Computing***
  Margolis, Jane and Allan Fisher, 2002: The MIT Press
  A well-written, engaging study about the gender gap in computing, with a focus on undergraduates at Carnegie Mellon University. One chapter discusses lessons from a summer institute for computer science teachers and lists strategies for recruiting girls and creating gender-inclusive classrooms.

reaching out to parents

Parents can play a pivotal role in girls' decisions about whether or not to pursue STEM. The biggest reason parents do not encourage their daughters to explore STEM is their own lack of experience and information. One of the greatest indicators that a person will choose a STEM career is having a parent who works in STEM. Often parents are unaware of the opportunities that lie ahead and the unconscious ways they may steer their daughters away from math, science and "techie" fields. Here are some tips for helping parents support their daughters' pursuits of STEM:

- Examine your conscious and unconscious biases. Do you encourage your daughter's interest in piano but automatically say no to the expensive video editing equipment she wants for her birthday? Which room is the family computer in? Have you ever taken your daughter to the local science museum? Be aware of the subtle ways that you may encourage or discourage your daughter's interest.[2]
- Learn about the requirements for enrolling in advanced science and math courses at your daughter's high school, as well as those for college. Start early. Are there courses she should take in middle school that will help her in high school? Will she need to take any Advanced Placement (AP) tests? A STEM academic track is not as hard as it seems, but it does require planning and preparation.
- Get informed about career opportunities in STEM and add them to the menu when discussing career options with your daughter. Ultimately, the decision is her own, but you owe it to her to make her informed of the gamut of jobs out there – and that she is capable of doing every one of them.

"making discoveries" (0:00:00 – 0:20:28)

If you have limited time, the first chapter of *The Gender Chip Project*, "Making Discoveries," is an excellent choice for groups that want to introduce issues concerning women, girls and STEM or reach out to parents and teachers. It features:

- Young women speaking about their desires to achieve success in STEM and examples of their achievements
- Young women speaking about the challenges they have faced in the classroom, both in high school and college
- Differences in the way parents and teachers treat girls and boys
- The case for involving more women in STEM
- Good visuals of girls and young women participating in STEM

"Making Connections" is a good choice if your activity has one of the following objectives:

- To recruit more girls to STEM and provide more support for girls and young women in STEM classes
- To raise public awareness and attract more resources to your nonprofit STEM program
- To encourage collaboration and the sharing of best practices among STEM programs
- To inform parents about their roles in supporting their daughters' choices
- To provide support and encouragement to young women already involved in STEM

"If girls don't get it right away, they think, 'Oh, I'm never going to get this.' If boys don't get it, they just keep hounding on it until they do."
-Heather, Civil Engineering Major

Research shows that girls and boys attribute failure in different ways. While boys are more likely to assign poor performance on a test to external factors such as unusually difficult questions or a teacher who is a hard grader, girls are more likely to attribute their performance to internal factors. For example, they are not smart enough, they weren't as prepared as they could have been, they are not talented in this particular subject area, etc. In *Unlocking the Clubhouse,* a computer science teacher observes, "Girls with Cs generally never take another programming course. Yet boys with Cs often go on to the next course, and boys with Ds sometimes will try to go on to the advanced classes."[4]

did you know?

In 2001, more than 200,000 women received degrees in science and engineering compared with just under 200,000 men. However, a gender gap persists in the hard sciences: Only 28% of computer science degrees went to women, a drop from 37% in 1985, and women earned approximately 20% of engineering degrees.[3]

did you know?

Percentage of girls who took the Advanced Placement (AP) exam in 2004:[1]

Calculus AB: **48%**
Calculus BC: **40%**
Physics B: **35%**
Physics C: **25%**
Computer Science (A and AB): **15%**
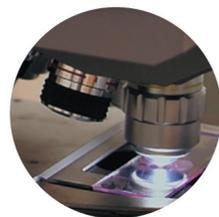
Creating support networks for high school, community college and university students who are pursuing STEM courses of study

Because the experience of college is one of its dominant themes, *The Gender Chip Project* is a rich resource for college and community college students who are pursuing STEM. It may also be used with high school students, provided an adult is present to guide discussion and provide supplementary information. Suggestions for using the film with young women include:

high school

- Host a lunch-time or after-school screening to recruit girls to STEM courses. Discuss reasons why girls choose to enroll or not to enroll in science, math and computer science classes. Ask the girls what they would need to stay on a STEM academic track. Share information about course offerings, extracurricular activities and field trips, careers, etc.
- Show the film in a classroom with both girls and boys to set the stage for discussion on topics such as gender, achievement, career and family. (See **www.genderchip.org** for study guide and classroom curriculum.)

community college and university

- Organize a screening and discussion to provide support for young women in STEM majors. Select a strong facilitator who will allow attendees to share both triumphs and challenges they have experienced along their STEM path.
- Show *The Gender Chip Project* at intergenerational potluck dinners or brown-bag lunches for female undergraduates, graduate students and faculty. Discuss the challenges young women of today face in comparison to those of 10, 20 or 30 years ago.
- Host screenings in student residences for young women who are considering majoring in STEM fields. Invite upperclasswomen to speak about their experiences in the university's STEM departments, their professional or academic aspirations, summer jobs, etc.
- Screen the film with community college students and discuss their impressions of college life at Ohio State. Inform students about the requirements for transferring to a four-year university, the benefits of a Bachelor's degree and career options for graduates of both two- and four-year institutions.

co-ed conversations
Try using *The Gender Chip Project* with a co-ed group. It's important for boys and young men to think critically about gender: women and men both benefit from two-way respect and support of each other's work and talents. In addition, boys and men of color are underrepresented in STEM and face many of the same challenges and barriers as girls and women of all races and ethnicities.

11

discussion questions

"seeing connections"
(20.30-37.25)

"Seeing Connections" follows the young women of Ohio State through their junior years. They have already declared their majors and are now charting the courses that will lead them to graduation and subsequently a job or grad school. This chapter also highlights:

- The progress women have made in STEM
- Internal struggles ("What should I do with my life?") and external obstacles (such as the persistence of sexism in some workplaces, the glass ceiling, etc.)
- Managing the transition from college to the "real world"

If you have limited time, "Seeing Connections" is a good choice if your screening is focused on:

- Supporting students who are beginning to think about life after college
- Helping communiity college students make the transition to a four-year university
- Facilitating intergenerational conversations between college students and faculty women

- *The Gender Chip Project* includes lots of footage of girls and women actively engaged in STEM. How did these images affect your experience of watching the film? Can you think of examples of other media (films, books, magazines, etc.) that positively portray women as scientists, engineers or computer programmers?
- The young women in the film speak about experiences early on that either helped or hindered their pursuit of science and other technical fields. What childhood experiences – positive or negative – had an influence on your desire to pursue STEM?
- What was your impression of Jennifer's decision to leave Ohio State? Why do you think she left? One of Jennifer's parting statements is "I'm tired of trying to fit in." Describe an experience when you felt like an outsider. What did you learn from this experience?
- Which of the women in the film (including the professors) did you identify with the most? Which of them seemed the most different to you?
- During the course of the film, the young women share a range of goals and dreams for the future. Erin says, "I'd like to make a big contribution, like, 'Yeah, that was made by Erin!'" Amanda says, "I want to make a lasting, positive impact on the people around me." What are your hopes for the future? What priorities will factor into your choice of a career?
- What changes would you recommend to make your school or college a more supportive place for women in STEM? How is your school or college already providing support to its female students and faculty?

did you know?

Number of women receiving science and engineering degrees[5]

1966: 50,000
2001: 200,000

resources

- **American Indian Science and Engineering Society** www.aises.org
  Promotes excellence, leadership and opportunities in education and professional development for American Indians and Alaska Natives. Offers financial, academic and cultural support to students from middle school through graduate school.

- **College Board** www.collegeboard.com
  One-stop shopping for college: information on college prep classes and entrance exams, choosing a college, financial aid and scholarship resources and more.

- **Engineers Without Borders** www.ewb-usa.com
  Humanitarian organization established to partner with developing communities worldwide in order to improve their quality of life. EWB has over 80 student chapters.

- **The Gender Chip Project** www.genderchip.org

- **GirlGeeks** www.girlgeeks.org
  Online community for women and girls interested in technology and computing. Website contains career advice, profiles of accomplished women (including young women) and business tips.

- **MentorNet** www.mentornet.org
  Award-winning e-mentoring network targeting women and other underrepresented groups in STEM. Offers one-on-one mentoring to community college, undergraduate and graduate students.

- **NACME (National Action Council for Minorities in Engineering**) www.nacme.org
  Scholarships and resources for African American, American Indian and Latino women and men students at the pre-college, undergraduate and graduate levels.

- **The National Society of Black Engineers, Inc.** www.nsbe.org
  Works to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community. Offers collegiate and pre-college programs.

- **Society of Hispanic Professional Engineers** www.shpe.org
  Works to enhance and achieve the potential of Hispanics in engineering, math and science. SHPE's Advancing Hispanic Excellence in Technology, Engineering, Math and Science (AHETEMS) Foundation offers college scholarships and K-12 programs.

- **Society of Women Engineers (SWE)** www.swe.org
  Educational and service organization with numerous opportunities for young women pursuing STEM such as scholarships, student chapters and career resources.

action steps

Ending your session by creating a set of actions or next steps is a good way to ensure that the conversation doesn't end there. For young women who want to continue the conversation or institutionalize support, here are some suggestions:

- At your high school, organize a Girls' Computer (or Math or Science) Club. Invite a supportive teacher to serve as your advisor. Organize field trips to local companies, science and technology museums, sites of engineering projects, etc.
- Organize a school-wide science day in which students compete in fun activities (e.g., an egg-drop from the top of the gym building). Make sure that girls are part of the leadership of the fair and aim for 50% of the participants to be girls.
- At your college, establish a chapter of the Society of Women Engineers, Society of Black Engineers or other national organization. Set monthly meetings at which prominent faculty or other professional women from your area speak about their careers, how they got there, challenges, etc.
- At your college, set up meetings with faculty and administrators to discuss challenges to women students in STEM majors. Ask for students to serve as representatives on departmental or curricular committees.
- Establish a mentorship program that pairs a) high school students with college students who are majoring in STEM; b) first- and second-year college students with third- and fourth-years; c) high school or college students with professional women from the university or local community.

did you know?

Salaries[6]
Note that these figures may vary depending on the field or specialty.

Engineer
Starting: upper $20,000 to upper $40,000
Median: $40,000 to $80,000

Computer Programmer or Software Developer
Starting: low $20,000 to upper $40,000
Median: $35,000 to $80,000

Medical Doctor
Median: $120,000 to $200,000

professionals and advocates

Inspiring professional women and other stakeholders to serve as role models and improve the STEM opportunities for the next generation

This section contains strategies for using *The Gender Chip Project* with professional women and others who can support and advocate on behalf of girls and women in science, technology, engineering and math. Suggestions for using the film include:

- Show the film at a meeting of your professional association or organize a networking event around it. Discuss participants' challenges and triumphs in their careers, and who supported them along the way. Set up a resource table with information about volunteer opportunities with local STEM programs for girls.
- Host a brown-bag at your workplace and use the film to spark interest in your company's community involvement program.
- Screen the film as part of a program focused on work and family. Invite scholars and advocates to speak on a panel and take part in a conversation about changing the culture of STEM professions and companies.
- Use the film to prompt discussion about women and STEM at your college or university. "Grade" your institution on how well it is doing to support female students and faculty in STEM departments and make recommendations for improvement.
- Host a house party/screening to raise money and recruit volunteers for your favorite STEM nonprofit or scholarship program. Invite young female program participants to speak about what they have gained from their involvement.
- Convene representatives from local foundations and corporate giving programs to screen the film, learn more about girls and STEM and discuss strategies for making the most impact with their dollars.

did you know?

Women scientists who have at least one child early in their careers are 24% less likely to achieve tenure than men who have early babies. The majority of women who achieve tenure have no children in their households at any point after earning their PhDs.[7]

did you know?

In 2003 Blacks, Hispanics and American Indians constituted only 7% of the total science and engineering workforce. [8]

discussion questions

- Name some of the factors that led you to pursue a career in STEM. What sacrifices have you made along the way? What about your education and career have you found the most satisfying?
- Amanda mentions her mother, a nurse, as one of her inspirations for her pursuit of a career in medicine. Anna talks about the teacher who encouraged her to stick with math. Which adult had the most influence on your decision to follow a career in STEM?
- What are some of the hidden barriers to women's and minorities' pursuit of and success in STEM?
- Of all the STEM sectors, engineering has the most trouble retaining women and minorities, with women of color being the least represented. On the other hand, women now comprise a majority of medical students. Based on your experience, what do you think accounts for the success or failure of STEM fields to become more diverse?
- In the last segment of the film, many of the young women are hopeful about the future and their ability to "have it all." What do you think will surprise them most once they begin a job or graduate school? What are your hopes for the next generation of STEM professionals, in both academia and industry?

"balancing acts" (37:25-55:30)

The final chapter of *The Gender Chip Project* focuses on the young women's accomplishments in their senior year and introduces the challenges women in STEM face in finding a proper balance between work and family. On the verge of graduation, the young women and Ohio State faculty members share their perspective on several topics:

- The belief that women carry an undue burden in sorting out the work/family dilemma
- The sacrifices some women make in order to get tenure or move up the professional ladder
- Ways that couples can work together to share childrearing responsibilities and support each other's professional growth

"Balancing Acts" can be an effective tool especially in the following scenarios:
- Women faculty interested in discussing challenges at their own university
- Women in industry seeking solutions to work/family challenges
- Intergenerational conversations between female students and faculty or professional women
- Community conversations about work, family and gender

resources

- **American Association of University Women** www.aauw.org
  National research and advocacy organization promoting education and equity for women and girls. Website has publications for download such as *Tech Savvy: Educating Girls in the New Computer Age*.

- **Anita Borg Institute for Women and Technology** www.anitaborg.org
  Mission to increase the impact of women on all aspects of technology and to increase the positive impact of technology on women worldwide. Partners with corporations, universities and government agencies to deliver programs that change the world for women and technology.

- **The Gender Chip Project** www.genderchip.org

- **Intel Computer Clubhouse Network** www.computerclubhouse.org
  Founded in 1993 by the Museum of Science in Boston and the MIT Media Laboratory, the Network now boasts 90 clubhouses around the world. Clubhouses have many volunteer opportunities for professionals.

- **Level Playing Field** www.lpfi.org
  Promotes fairness and equity in education and the workplace through advocacy, research and academic programs and scholarships for underrepresented groups. Website has publications for download including *Underrepresented Students in Science, Technology, Engineering and Math*.

- **MentorNet** www.mentornet.net
  E-mentoring network targeting women and other underrepresented groups in STEM. Recruits professionals to provide email-based mentoring to community college, undergraduate and graduate students, post-docs and untenured faculty pursuing careers in industry, government and academia.

- **National Center for Women & Information Technology** www.ncwit.org
  Collaborative effort among colleges, universities, individuals, nonprofits, industry and government to ensure women's full representation in information technology and computing. Website lists numerous ways to get involved.

- **National Women of Color Annual Awards Conference** www.womenofcolor.net
  Annual conference held since 1995 to celebrate women of color's achievements and connect minority women in technology careers with mentors and employers.

- **WomensMedia.com – The Site for Working Women** www.womensmedia.com
  Online resources to help women advance in their careers. Sponsors the project, Computers Are for Girls, which focuses on girls through age 10.

- **Work and Family Institute** www.familiesandwork.org
  Nonprofit research center that provides data to inform decision-making on the changing workforce, changing families and changing communities. Website includes research summaries and advice for employers and employees.

did you know?

Women of color in the science and engineering workforce in 1999:

Asian/Asian American: 2.6 %
Black/African American: 1.3%
Hispanic/Latina: 1%[10]

e n d n o t e s

1. College Board AP Report to the Nation, 2005

2. Margolis, Jane and Allen Fisher. *Unlocking the Clubhouse: Women in Computing.* 2002: The MIT Press, Cambridge, Massachusetts.

3. *Women, Minorities and Persons with Disabilities in Science and Engineering*, National Science Foundation, Division of Science Resources Statistics; and "Engineerina and Technology Enrollments, 2001", American Association of Engineering Societies.

4. Margolis, Jane and Allen Fisher.

5. *Women, Minorities and Persons with Disabilities in Science and Engineering*, National Science Foundation, Division of Science Resources Statistics

6. Salary figures are from Graduating Engineer Online **www.graduatingengineer.com** and **Payscale.com**, a job profile and analysis website.

7. Commission on Professionals in Science and Technology **www.cpst.org**

8. Latin American Engineering Students Association, Chapter of the Society of Hispanic Professional Engineers

9. "What We Know about Girls, STEM and After-school Programs," prepared by Cheri Fancsali, Ph.D., for Educational Equity Concepts.

10. Commission on Professionals in Science and Technology **www.cpst.org**

11. *Ibid*.

did you know?

In 2002, women represented 23% of the federal science and engineering workforce. Women's overall participation in the U.S. science and engineering workforce is approximately **11%**.[11]
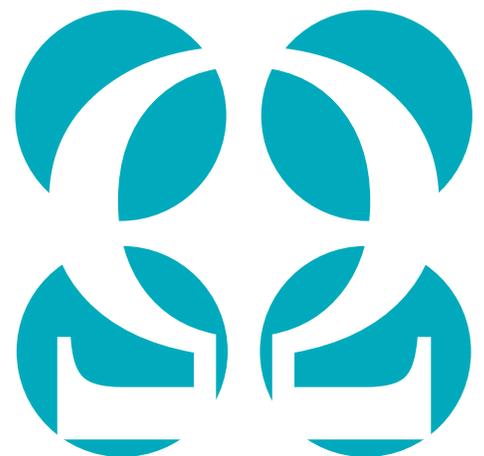
acknowledgements

Media Working Group **www.mwg.org**
is a non-profit media education, production, and development organization providing an organizational framework for artists and media educators to conduct diverse multi-disciplinary work in media culture. It is a hybrid of a media arts center, media institute, arts incubator, and artist network. MWG is designed to stimulate and support the creation of video, film, and web-based media. Its training and education are designed to encourage critical understanding of the artistic, social and cultural impact of the media.

Media Working Group documentaries and feature films have enjoyed national and international attention and distribution on BBC 2, BBC World Services, WNET-NY, POV, The Discovery/Learning Channel, national and regional PBS.

Active Voice **www.activevoice.net**
is a team of strategic communication specialists who put powerful media to work for personal and institutional change in communities, workplaces and campuses across America. Through practical guides, hands-on workshops, stimulating events and key partnerships nationwide, Active Voice moves people from thought to action. By highlighting compelling personal stories and perspectives seldom found in mainstream media, Active Voice offers a much-needed outlet for people across America to speak out, listen up and take the initiative for positive change.

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