

## Discussion Table Questions and Comments

### **Question 1: Girls/Women in computer technology - why they drop? What can be done?**

- Name it something different- alternative...
- Engineers without Borders
  - Mythbusters
- Charismatic teacher
- Schools that provide engineering feeder and exposure
- Find connections from bodyme – engineering.
- Don't tell a kid that they are going to change their major, tell them that they can change their major.
- Give real life examples of what engineers, scientists do..
  - Start in Middle School
  - Give real life examples of what engineers, scientists do...
  - Paid internships for high school girls
- Guidance Counselor-need involvement
- Zoey's Room: Move beyond by going to orgs with girls (YMCA) need group to feel comfortable. Low income kids wouldn't go to Y, etc. Partner with CAP + Alford—close to where they live-create teen center-kept everything there by partnering. Much more comfortable. IMPACT-some regrets from other segments of community. Helps to have high end structures in low-income communities. Find Scholarships + promote them. Re-educate guidance counselors. Hold parents socials to give help. OR go one –on-one with parent at home or community centers or afterschool programs.
  - Peer mentoring
  - Role Modeling
  - Journaling- freedom of expression
  - Lessons on gender roles
    - Have a teacher do self-assessments on gender roles
  - Curriculum- standards? Health?
  - Learning styles – assessments are there certain styles that appeal to girls more after? – eclectic approach.
  - Talking about real life situations
  - Health classes in middle school
  - More research
  - “peer tutoring”
  - Journaling
  - Special courses to teach girls
  - No resources
  - Self-assessments of teachers.
  - “mentors”

- Girls need to connect
- Creative writing good outlet.
- Look at lesson plan
- Reach different.
- Book: 101 ways to achieve self concept.
- High School students mentor younger kids.

**Question 2: How to get high schools girls interested in engineering?**

- Curriculum-semester long project of girls + role models: Zoey's Room + Coastal Studies
- Highlighting more women role models
- Imbed in-service training
- Connect teachers with women in STEM who will present activities in the class room.
- Femineering?
- Exposure Relevance
- Inspiring girls through experiences like Challenger learning Center and Women in Trade Shows.
- Get media interested in topic so it gets attention.
- Robotics team- currently only "boys"
- **Stay away from negative connotations "geek squad" "Hot and Sexy" girls can be scientist/engineers too!**
- Nerdgirl.com, Alice, Scratch, Repunzel – online apps computer game building free.
- Can go cross-curriculum with these
- Sharkattach.com-math skills.
- Other mother- caring adult – overtime
- Prevention Education
  - Break down myths and facts about gender equality and discrimination through education (activities and discussion) to all them to better understand that what occurs in real life is truly gender bias and a true culture issue.
- Artade- Amy Sullivan – Handy Girls, Hghw.org –creating handiness, zone for girls. Adults creating environments for all girls (commit to making social changes.)
- Address society's perceptions of girls. We want to prove what girls say as true- its all right there do much as it always was.

**Question 3: How do we find local, "real" projects which seem relevant to girls who want to help others with engineering, chemistry, biology, and physics?**

- Job shadowing
- Find out what local companies need for skilled workers.
- Peer-to-Peer role

- Environmental Evaluations on lifestyles/consumer products—real projects. Finding girls for local projects rather than local projects for girls. Invite girls individually—target girls: extra credit opportunities (girls are generally concerned about their grades), write a paper or join the team. Too much time testing rather than doing! Girls like hands on! Once in higher ed, have lost creative thinking skills. Side discussions: many things/events happening at the same time. Why did designs change? Where did the designs come from, who made this and why? Do students really think about where things come from and why (their history, etc).

#### **Question 4: Models for teacher/professional development on strategies to support girls in science and math classrooms?**

- Provide mentor as long lasting muse
- Mythbusters
- Hardy Girls
- Magic=Mentors a girl in Construction
- WWC-Totally Trades Conference
- Engage parents along with students – let students be who they want to be
- Many teachers don't know what Engineering is- they need internships.
- Lack of Parental support- complicated might lose child care provider for younger kids.
- Lack of role models and parent support.
- NSF—teacher—research project. Lake associations across state, soil erosions/watersheds/invasive plants, mostly spring and summer could be full. Projects for students to do, Unity College-Lois Ongley, Coop. Ext @UM Laura Wilson. Can combine with aerial photography year to year. Globe.org, training for teachers for collection of data and evaluation. Mitchell institute—"get wet" to encourage ability to use citizen data. UM speakers bureau—expand to professionals, consultants for town—contact town office. Society for women engineers. Get teachers to develop and design real projects---attend workshop for teachers to develop these skills
- "Stemming the Gap"-course for teachers to dispel misconceptions about science and tech careers.
  - Want "Hands On" how to address gender differences. Challenge center, shelter building. Example: girls collaborate in big groups, guys don't. Clarify career options, challenges to staying in Maine. Models out there: courses for re-certificationm challenges addressing misconceptions workshops, work in labs or job shadow, professionals into classes, sabbatical for teachers (Jackson lab). Find and address misconceptions about what life in STEM fields is like. Classroom Obs: Eye on gender; not in school logs for teacher eval. Training to deal w/ day to day, chilly climate/gender/bullying. Teacher prof. development. 2 prongs: Science/Gender. ME math/science alliance used to do gender workshops (15-16 years ago), resurrect those. How do you get the teachers interested so the students can get interested.

**Question 5: How are we “teaching our teachers” to support the development on and self confidence of girls throughout education in curriculum?**

- Coach teachers not to “hide” science/STEM content in the classroom- after an activity let them know “That was science.”
- Parent/Community members STEM/gender resources to give in-service to teachers on prof. development days.
- We look at what people are good at and grow with that
- Who is doing professional development for pre + in-service teachers that speak directly to classrooms practice that research show works to make a difference for girls + STEM.
- Teachers that have energy always helped me to be more self confident whether I was right/wrong
- Lessons with no definite right answer, so they are not really wrong
- Have a women’s class, woman teacher with female students
- Pay attention to what is going on between your students
- Find a “champion” teacher or school staff person to enlist support from other staff/admin to attend education meetings about how to interact with students # each other to promote confidence.
- Is there research or professional devotion for teaching girls and encouraging girls for math and sciences make a difference? Model learning styles, which are different for boys and girls
- Teachers job shadow-paid time  
Expanding teachers knowledge of breadth of fields in STEM
- “Stemming the Gap”-course for teachers to dispel misconceptions about science and tech careers
- “You are a scientist!”
- Want “Hands On” how to address gender differences. Challenge center, shelter building. Example: girls collaborate in big groups, guys don’t. Clarify career options, challenges to staying in Maine. Models out there: courses for re-certification challenges addressing misconceptions workshops, work in labs or job shadow, professionals into classes, sabbatical for teachers (Jackson lab). Find and address misconceptions about what life in STEM fields is like. Classroom Obs: Eye on gender; not in school logs for teacher eval. Training to deal w/ day to day, chilly climate/gender/bullying. Teacher prof. development. 2 prongs: Science/Gender. ME math/science alliance used to do gender workshops (15-16 years ago), resurrect those. How do you get the teachers interested so the students can get interested.
- Teacher prep classes – planned and required must cover gender equality
- Do not say to student “you should be” say “You could make a great”
- See things yourself, your students do.

- Do not dismiss a student's doubts
- Write notes on student's papers "good job" "I like this"

**Question 6: Curriculum ideas and/or suggestions for development of a high school science elective that focuses on "Women in STEM"?**

- Mentor=skills
- Muse = relationship/inspirational
- Introduce student to the outdoors
- In service days, focusing on gender bias and how it affects the development of students and academic success
- High School
  - Science elective focusing on women in STEM.
  - Curriculum/
  - Model course?
- Clubs for girls in science – robotics, nerdgirls.com, build games, application scratch, alice, rapuninser =game building site
- Science/Math club for girls only
- Solutions at college – create "research" jobs so students don't have to work in unrelated dining hall jobs
- Expand NSF GK-12 programs. "Get Wet" program at George Mitchell center, show that students collected data are viable for use in research. Go beyond academia—engage professionals—speakers from groups such as society for women engineers. NSF tie teacher into research project.
- Focus a science class for women in science as a class for credit.
- Need Hands on Activities. Design renewable energy system for high school. Target girls with individual invitations. Part of the class rather than after school because kids are so over extended with sports, etc. Doing environmental evaluations of your life style.
- Bringing in engineers and scientists from companies. Thinking about what is engineered—ex. Soda can production, composition, chemistry of soda, etc. labs on products: pennies, paper towels, etc.
- Design a project students will remember. Mentoring - older girls with younger girls. Project: hands on-designing a bridge, water monitoring, renewable energy, bear project (winter) visit to den, river clean up. MMA parents, work with students. Finding girls for local projects—invite one by one, target girls. Envirathon/contests-extra credit projects, make it part of school day, not after school. Promote science fair. Environmental - consumer products.
- Robotics—drawing only boys? Department of Fish and Wildlife doing a project? Girl Scouts—mentoring, women in engineering/partnering. Alternative energy programs, applied

science, envirothon competition—invite girls directly, personal contact or invitation. Skateboard park/playground.

- “You are a scientist!”

### **Question 7: Math and Science integrated curricula (research)?**

- Robot-athon – build robots and do things with them ex: robot that vacuums
- Famous things engineers have done
- Day camps for girls
- Combine it with other topics to introduce it. But do not separate it from other educational topics
  - Carpentry, CAD, Welding, Robotics, Engineering, Architects
- Challenge center- expand to follow up high school programs for 9<sup>th</sup> grade
- Name it something different- alternative...
- Engineers without Borders
- Semester long paid in Stem work and designing curricula in promoting into the classroom
- Comfortable. Low income kids wouldn't go to Y, etc. Partner with CAP + Alford—close to where they live-create teen center-kept everything there by partnering = much more comfortable. IMPACT-some regrets from other segments of community. It helps to have high end structures in low-income communities. Find Scholarships + promote them. Re-educate guidance counselors. Hold parents socials to give help. OR go one –on-one with parent at home or community centers or afterschool programs.

### **Question 8: More talk about the perception that girls have already achieved equality that we have grown up encouraged to “be anything we can be” so why are we still whining about sexism and gender bias?**

- Young folk believe we have met equality
- Get one young women to talk about it then there will be lots of discussion
- Need to confront girls? Is make them reconsider their perceptions
- Amy Sullivan article on Hardy Girls (hghw.org) “once you're “in” you don't want to complain or admit there's a problem.
- Help girls + boys deconstruct media
- Sense of belonging, what does harassment look like?
- Media immersed culture maybe there's a different way to look at it..
- Confront girls? Feminism is a dirty word.
- What is comfort level for male counselors, bring this up to girls
- “Killing us softly” gender discrimination in media
- Want role of being a sex object
- Girls culture-attractive to them because they become more valued. Say there isn't more to you? Bring resistance.
- Deconstruct Media = isn't there more to you!

- Reflection after an adventure based on experience that shows how girls are treated differently or act differently, when in “mainstream” subject to the bias.
- Karen Pittman-charismatic adult
- Recognize a “cultural issue” develop mentor relationship as women don’t perceive gender discrimination until one person mentions it, then it grows.
- Strength-based approached develop a community of muses
- Can’t do it when you’re in it after college- could embrace it.
- Once girls get out of the environment they change it in back country but changes once back in environment.  
Show the #s
- Open discussion with those adults to help them break down their own stereotypes and biases in order to better serve the student they teach.
- Deal with what about the poor bus? Instead discuss larger picture. Around gender find lots of ways to expand gender role for kids.
- Role model: Emma Creaser, belly dancing  
Lack of awareness of opportunities
- Pay inequity means everyone loses as more and more women support their families and are equal to their husband’s responsibility.
- No, we are not equal – here’s how I can show you...
  - We already have to prove our capability in so many ways/fields in non-traditional. Careers engineering classes, the lab etc. men don’t have to
- how to attract a wider audience to gender focused events / training on feminism and sexism? We don’t want to preach to the choir - need to raise the awareness of the unconvinced- the general population and those who fell they don’t have to experience or witnessed discrimination/ inequality. Awareness events! Need awareness of subtle sexism since it’s ubiquitous and widespread. Need attention getters! Need to desensitize people to unacceptable behaviors and attitudes.
- We are so desensitized to sexism
  - Language
  - Fashion
  - Voice- who gets heard
  - Opportunity
  - Wages
  - Power/status
- Forum for discussion on university campus
- Awareness program
- Films- viewing them on campus – bring the extreme- when does it become offensive? We are desensitized?

- Awareness training –multicultural forum gender issues
- Discuss wage gap
- Media is so powerful use media to analyze
- Are we angry? Are we frustrated? Is this increasing?
- Denial!
- Provide negotiation skills/training
- Address/acknowledge the problem exists – create a forum Media campaign
- Promote coalition/stories
- Push boundaries to get them in to talk about it
- Need awareness training/ events for training.
- Create a forum open to all
- How to prepare teachers through curriculum.
- Use wage equity-builds into STEM!
- Men's Issue/Not a Women's Issue.

**Question 9: If you are a scientist with a program available, how do you get “buy in” from middle school or high school science teachers?**

- Person a person no matter how small
- School spirit gives students confidence that their school is good and they are there so they are good too.
- “Lollipop Exercise” – STEM, teach the topic and tell them it was science. Don't hide it, show them science and its applications
- Share expertise- look at parents, teachers, mentors to share experience look for forums- internet, newsletter
- Girl Scouts collaboration with local schools to organize campus invasions so that low-income girls have the opportunity to participate.---Washington County especially needs support, Axiom Technology...mentors/muses/role models!!! Personal contacts with STEM faculty. At programs for low-income families: food, dinner, invite siblings, childcare...The women of the commons in Down-east: communities revitalization: kids could get involved in projects...go to the kids, rather than expecting them to come to you!
- Fear of the unknown-if your parents didn't go to college, why should I? If my mother/father did a certain career why should I stray? Show students college atmosphere-campus invasions-Girl Scouts-edge program...STEM fields perceived as expensive. Re-educate guidance counselors to help kids find scholarships, help parents fill out applications at community centers in low-income housing communities.
- Role playing workshops for classroom dynamics

**Question 10: How do we help students feel confident they can compete in STEM with students outside of Maine and Globally? Especially when it's hard to recruit competent math and science teachers in first and second schools?**

- Scholarships-need to make them more aware that there are a lot available
- Between Productions-panders to fashion now that "it sells"—didn't use to—they used to focus solely on self-esteem. Needed: website development, web 2.0 applications (understanding how you can develop your own apps.) Direct them to girl friendly tech sites. How to get girls into technology? 150 virtual worlds.  
[www.virtualmanagement.com](http://www.virtualmanagement.com) [www.newmoon.com](http://www.newmoon.com) Second Life. E-extension—"if you're going to do a gardening class, you can do it virtually in second life. Spore.com - create a biological entity and grow it virtually. SIMS-girls create city planning and architecture. [www.asklissa.com](http://www.asklissa.com)? Google to be

**Question 11: Racism among girls, rural, v urban, inter-minority.?**

- Limited opportunities in Maine
- Maine learning R.
- Engineering
- Careers
- Find out what local companies need for skilled workers. Peer-to-Peer-Role Models
- No Extracurricular Programs
- Personal contact from college professors, etc. Male approval
- Comfort Level
- Guidance Counselor-need involvement

**Question 12: What are the barriers that low income kids face for STEM?**

- Guidance counselors don't think out of the box. Often struggling to survive financially. Lack of parental support. Can't stay after school for tutoring. No money for summer camps. Schools don't inform parents and students of resources and programs.
- Very few role models in rural areas. They can't picture themselves in these professions because they don't see these professions around them in their everyday life.
- Lower SES community as a safety net. No role models. Fear of the unknown. Parents cannot afford to send them to math/science camps. Low income kids pushed into vocational programs. Faculty/staff assumes low income families cannot afford workshops/programs, so they do not even mention them.
- Question barriers that low income kids face in STEM.

- Lack of role models, lack of parent support
- Pressure to stay in the same area w/family and not go too far away.
- No Extracurricular Programs
- Personal contact from college professors, etc. Male approval
- Comfort Level
- Guidance Counselor-need involvement
- Parents as barriers
- Need 1:1 Help
- Tradition (no history of college in Family)
- Maine scholars day-bring students on campus, have them fill out scholarship forms with help?
- Barrier: Geography of Maine and proximity to college or university
- Second or third generations with low aspirations—school can't be a social worker. Get mothers into hardy girls - no one in family didn't get pregnant young- walk youth through.
- Fear of school systems.
- Small-town barriers.
- Way of life with seasons: never thought of going to college.
- We need help with connections. Travel to college to get them there escorted. Key to get them there: feed them (ask businesses), bring siblings, many volunteers.
- Show application process, show college life, ME scholars day-I week, bring 2 kids each H.S who need scholarships.
- Campus invasions, girl scouts tour.
- Mentors and Muses: See Rosemary Wilson-last year's valedictorian was from a low income background. Find her and get her to speak at next conference.
- Have sophomores take college courses.
- Colby Kids + teen center nurtures and make a difference.
- Take Youth to Campus more than once.
- 4<sup>th</sup>-5<sup>th</sup> grade level with older student. Students stay 4 years (350 students doing this) go over homework—need male figure, allows boys to bond.
- Reverse mentoring: youth engage in community, visit adults: get e-mail, use digital camera with senior citizen.
- Positive support from father/father figure. Needs approval from a man to feel they can go against boys. And girl can still be feminine.
- Busing for programs.
- Girl scouts open to everyone.
- There's always money—people waiting to be asked to give.

- Higher education on-line for lower income in Washington county— telecommunications, Axiom Technology.
- Self imposed pressure to stay close to family (don't go too far for college)
- No professional examples ex. CAN thru voc instead of Dr's who took STEM classes
- Fin. Aid Gaps
- Burnout - among guidance counselors – don't want to or can't take time with individual kids options are military or community college. Potential for change with advisory gaps in High school.
- Role models don't see other possibilities. The “street” in rural Maine.
- Faculty/Staff may assume families can't afford opportunities.
- Parents limit options
  - Parents refuse to do forms FEAR
  - “CAN won't help you get into nursing program” may get 3-4 hrs/wks
- During the summer: camp Natarzwi, Pondicherry and Kirkwold, Girl Scout projects w campers. Data collection on erosion and watersheds. [www.globe.org](http://www.globe.org). teachers can do real projects. If not what help/training do they need? OSHA certification?
- Barriers: learning results, OSHA, teacher prep at elementary level, size of state geographically and low population
- Misconceptions of
  - What it is – it is not a hard hat and slung tool belt working on an oil rig of big machinery.
- Strong math not really needed.
- No interest from girls due to the lack of connection to the real world
- How do definition? Field is changing attracted to personality.
  - YWCA and other diverse groups – teen centers and youth centers great places for low income youth- established programs
  - Parents Socials – inform them of the scholarship opportunities then go do house calls to help parents with kids' applications.
  - Fear of government and institutions seen as threat
  - Small town barrier- why go to college?
  - Me- peer to peer, reverse mentoring STEM, Topical Mentors
  - How SES kids: perceivably cost barrier
  - “Mentoring” – Colby students in the 4 and 5 grade of Center One schools. Part of Colby freshman curriculum

**Question 13: Expose girls to the broader range of careers in STEM?**

- Do small group projects to promote group participation
- Be happy
- NCATE makes colleges to make changes
- Give teachers permission and skill to intertwine in exchanges
- 1<sup>st</sup> figure out how to do it
- Phys. Ed/coaches bias of in your face

- Don't tell a kid that they are going to change their major, tell them that they can change their major.
- Scholarship money
- Start in Middle School
- Give real life examples of what engineers, scientists do...
- Paid internships for high school girls
- SWE certificates, merit program to a high school junior or senior exceling in math and or sciences
- Pre-engineering curriculum
- Job shadowing
- 4-h edge weekend- shows real life engineers-also bring them to a campus: EYH - Start Early
- Making the connection between STEM opportunities/education and higher quality of life explicit. Location, location, location - kids feel most comfortable in their own neighborhood.
  - How many summer camps?
    - For technology- basic program writing? Safe setting
  - Need a person to go to a mentor- college age, ever stuck what do you do? Go online? Ask your mentor
    - Ex. connecting with someone virtually that has similar situations/problems
  - \$ for equipment
  - Websites for special interests
  - ALICE programming langauge for developing video game, virtual reality – it's free.