

How to Raise Girls Excited About STEM

OLIVIA RICHTER (PRODUCER): Hello and welcome to the Big and Little Podcast, the podcast of Boston Children's Museum.

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OLIVIA (PRODUCER): How can we as a society motivate young girls to continue to engage with STEM in a culture where so many are steered away as they get older? The STEM gap is a very real thing. Women make up just 28% of the workforce in science, technology, engineering, and math. Girls and women are systematically tracked away from science and math throughout their education, limiting their access, preparation, and opportunities to pursue these fields as adults.

Madge Meyer is the former Chief Innovation Officer and Technology Fellow at State Street Corporation, where she worked as Executive Vice President for over a decade. She works with MIT collaborative initiatives to bring innovative solutions to problems spanning health care, education, sustainability, and veterans' reintegration. She's also the winner of countless awards for innovation in the field of technology. With all of her achievements, Madge has faced numerous challenges as she came up in her career as a woman and an Asian-American immigrant. Madge's outstanding achievements and years of experience have given her impressive wisdom on what it takes to be highly successful as a woman and minority in the male-dominated world of STEM. In today's episode of Big and Little, Madge shares her inspiring story and wisdom, and offers strategies for parents and teachers to keep their girls engaging with STEM and eventually find career success in those industries. There's good news. It's less complicated than you might think to raise girls who become innovators in science, technology, engineering, and math. Let's dive in.

CAROLE CHARNOW: Hello, Madge. It's so nice to talk to you. Welcome to the Big and Little podcast.

MADGE MEYER: Hello. Good morning. Thank you so much for giving me this opportunity to share my lessons learned.

CAROLE: Wonderful. Let's just start by hearing a little bit about yourself. You have a very, very interesting life path and career. I know you came to this country in the 1960s from China. But can you tell us a little bit about yourself and how you came to America and how your career path unfolded?

MADGE: Sure, Carole. You did right. I was born in Shanghai, China and grow up there until high school. And then we went to Hong Kong and from Hong Kong, I only stayed there very briefly to learn English because we were under communist, so we had Chinese and Russia. And when I got to Hong Kong, learned English to go back home to the United States, Texas.

All four sisters, my mother-- my parents had four girls and one boy. So all four of us went to the college in Texas and I quickly graduated because I was able to pass a lot of the tests, study math and chemistry. And then I went to St. Louis for graduate school one year. In the summer, IBM hired me as scientific programmer, so I literally did not go back to graduate school and started career with IBM.

And I was really fortunate. Those days, space program was huge in IBM. They had whole division manage that. And so they assigned me to work on Gemini 10, 11, 12, and where I met my husband. He did the mathematical analysis, the aerodynamics, how it impact the rocket. Then I took his analysis, putting the machine language, sent the astronaut to the moon.

And why I mention this project, because it's so important because I learned innovation. And those days, IBM, huge machine. They had a tiny system. And I thought, why can't we do that to run the whole business?

And speed, they give us assignment and say, you got to get it done right away. Never asked how long would it take you to get it done. So we just never sleep, work around the clock to get it done.

Another one is project manager said, Madge, if you make any mistake, astronaut could die. And I thought, why? And I was a young lady. I said, why do you put this burden on me? I was petrified.

However, those are the three lessons carry me through my entire career and helped me to be successful.

And after that assignment, I was on very different assignment with IBM. 1998 I had an opportunity to join Merrill Lynch. I thought would be good to learn financial services.

But after three years, State Street offered me a job. And I say, well, why not. So I joined State Street 2001 and I've been in Boston ever since that time. And I had a wonderful career at State Street because that was later part of my career and I've become a little smarter how to navigate the company's culture and all the things going on.

And during my experience in my grow up, what is a constant theme is change is constant. I have to change different country, different ocean, and all that. Another one is as I grow up, my parents always told us, the four daughters, you can do everything boys can do. Don't let anybody tell you, you cannot do it.

So it gives us a lot of confident drive. We all want to make parents proud of us.

And another thing I learned is you never let anything you cannot control bother you. But there were always things, people saying, oh, that bothers you? Never let things bother you if you cannot control, otherwise you will be wasting a lot of your time.

CAROLE: Wow. What an incredible story you have. And working on the space program and meeting your husband there during a time when we were going to the Moon, how very, very exciting. You wrote an article recently, Madge, for Sampan, which is the bilingual Chinese English newspaper in New England. It was on International Day of Women and Girls in Science. The article was called "Be An Innovator," and you shared your story and urged young women and girls to consider careers in STEM fields that you pursued and were very successful in. What inspired you to write this article?

MADGE: Well, I've been involved with AACA for ever since I came to Boston, for decades. And they not only help immigrants, they also help local minorities. So it's beyond Asian, literally.

And also what they do is they have a children's program. So I thought that Sampan is the only Chinese newspaper in the 40 mile area near Boston, so it expanded to reach out to not just Boston area, outside of Boston area. So I know Mary Chen, the CEO, really well. When there was a Day of International Science for Girls and Women, and I told Mary, maybe we should write an article.

So she thought it was a great idea to provide a consistent message that you can do it, because the message I want to give, if I was able to do it as an immigrant, you can do it, too. There's no magic. So that's why I wrote that, want to encourage the young people or any immigrant because age doesn't matter. Everybody can be innovative, can be successful.

CAROLE: That's such an encouraging message for all of us. But you must have faced some challenges. You described how you grew up in Shanghai, you had a great education, you had wonderful parents who encouraged you. But still, coming in to the United States as an Asian-American woman into the field of science and technology must have been very challenging for you. What challenges did you actually face, Madge?

MADGE: Well, here's the thing. Just remember, it's not 2022 when I started my career. It was in the '60s. And I was always one of the very few women among all the men. It's a big class and they were probably less than five women at most, sometimes only two women or something. Most are men dominated. But it didn't bother me because I just enjoyed this math and science. So I thought, that's great. And I met a lot of very smart, really challenging me. Not only they a male or whatever, they're really, really smart and they're very kind to me because they feel bad. I was this little female person and I have to kind of struggle through my career with them. So many of them really, really helped me in my career. And so that is hard, but as Asian we have additional ceiling. Not only they call glass ceiling normally for minority or female, we have also another layer of they call bamboo ceiling. I just--

CAROLE: Oh.

MADGE: Yes. And I did not realize it when I was in my career, and later on I learned it, the bamboo ceiling, which means executives always think Asians are good working, but never good in leadership. It's interesting because we are very quiet.

As a leader, you cannot be quiet. And usually we accept whatever happened to us. We're not fighting back all the time or speak up or complain because complaining is never a good thing in Asian culture. Another thing we don't do is bragging. So one of the executives told me, Madge, if you don't claim the credit you have accomplished, so the credit was left on the table, free for anybody to take it. That was a wake up call for me. I said, oh wow.

I always thought if I did a good job, I get rewarded. It's an automatic process kind of thing. And it wasn't. Those are lessons I learned from a lot of male executives.

CAROLE: That's incredible. I love this. Own your own accomplishments. I know many women are reluctant to take credit and are often deferring the credit to others. So that's a great lesson.

Do you feel that, looking at where we are now in 2022, that we have a ways to go in terms of reaching gender equality in STEM fields? Do you feel that there is still gender bias in the field?

MADGE: Absolutely. I tell you, Carole, all the corporations I work for, even in '60s, IBM, Merrill Lynch, State Street, none of the companies said, let's discriminate against certain race or sex. They all have respect for the individual, equal opportunity, all those. The policy was excellent.

However, culture change of people's mind takes a long time. There would be always either conscious or unconscious bias. Let me give you one example, Carole. I always think big, tall men get executives.

So one day, I was seeing a vendor new, and they have these names that you can use for women or men. They said the CEO is such, Leslie or something. You don't know if it's a man or woman.

And two people came in, a very small lady, and next to her is a tall, handsome man. If I was not careful, I might shake hand with the tall man first, thinking he's the boss. But I told myself, be very careful. So I just said, I'm Madge Meyer and I want to see who's coming over to shake-- and I stretch my hand out, look at both of them. And the woman came over and said, I'm Leslie.

So I say, oh wow. Luckily I did not make a mistake. And hierarchy in business is important in a way. I want to be polite to people come to my office. And so there was not a chance that I wanted to make a mistake. So some of that is conscious.

It's unconscious. You have this impression in your head, can change it. And I totally understand people's unconscious bias. Is it good? No, it's not good. Everybody should work hard to change it.

CAROLE: Yeah. You know, I was thinking of that film the Hidden Figures. Your story is very similar in a way. I remember when we were talking yesterday about women in the early STEM fields, there weren't even bathrooms for women in these labs. I believe you told me a story about that, that you could relate to.

MADGE: Yes. I was in-- I wasn't in NASA. I was in one of the IBM buildings. They have a rotunda and three sections kind of connected through a rotunda. And in the section I was with, they only have male bathrooms. So I had to go to the administrative building to go to ladies room.

It never bothered me. I never even had second thought because those days, I was really, really naive because I always thought, oh, it's American culture. Of course, I'm in a male dominated area, they don't put a female. So I never complained, just went to bathroom.

However, the problem with me, I constantly think about the program I was writing, so I got distracted coming back. I end up in the Apollo section. I didn't have a confidential clearance or something to be there. Besides, I had a micro miniskirt and long black hair, and the security guards thought I was a high school student--

CAROLE: A high school.

MADGE: --has invaded the building. So he caught me in the hallway-- they had a monitor-- and brought me to the security office. I told him, I have a badge. I work for Gemini 10, 11, 12. He said, call your manager, get you down.

So I call my manager. I said, Howard, you've got to pick me up in the security office. He said, what happened to you? What did you do? He thought there's something really bad. I say, nothing, I went to the bathroom.

CAROLE: That's just crazy. But these women and yourself would serve as fantastic role models. I know that film was very, very successful and it was quite remarkable to see what they were up against and certainly what you were up against. So it does make me think about parents and teachers and those that have the opportunity to set their students on a direction.

I know here at the Children's Museum, we put a lot of effort into understanding how to make science in the STEM fields fun. In the hope that young girls and boys will stay engaged in STEM learning, what advice would you give to our listeners who are parents and teachers about how to get their kids excited about STEM, and also how to keep them engaged to a point where they really do consider a path down the STEM field?

MADGE: Right. Through my entire career, I always ask people working with me, first time I met them, I said, are you having fun? Sometimes they were really surprised with the question. And say, are you having fun, they always say, what do you mean? I said, if you enjoy, you can do a really good job.

Now, children all want fun. The only way to-- because people think STEM, math, science, tech, they're so boring, because all they can see is coding this machine language or calculate nanoseconds for each instruction. These are boring. They're right. So don't make it complicated for them. Make it fun.

These days, I think I just miss the days I raised my daughter. We didn't have so many technologies. Now, all different technology. You can get them any technology will make a fun game for them.

And I remember even when my daughter was growing up, my husband and I purposely didn't learn how to set a VCR, so we asked her to, every time we want to record something or see something, Michelle, can you do that for us? And she sometimes complained. Oh, you people are so dumb. I have to do this one. She was so good at that.

So this is how they make it fun for them, then they will get involved. You've got Xbox. You've got iPad, iPhone. If you don't want to give them an iPhone so they-- give them some other things that they can just disconnect from time to time. Put some discipline around it. But make it fun so for them to want to be involved.

CAROLE: Yeah. And problem solving, which can be very rewarding for young kids, too. If it's fun, their attention will be held, yeah. We're doing a program here at the museum in engineering and empathy, which is trying to bring a perspective of care and concern for engineering and design. It makes me wonder what you see as the danger of not having women in STEM fields.

MADGE: Oh, huge. If you look at population-- I don't know exact number, but at least let's assume half are female, huge population. I always say, even in my book I say, diverse perspectives, multiple perspectives is the best for innovation. With the women, a part of it were understood what we need, exactly how to make it comfortable and usable and all that. Without women in STEM, you will miss a lot. And Carole, you just touch upon empathy. Artificial intelligence, it's not the machine is so smart. It's how human beings tell the machine how to behave, how to act right ahead so they can do that, even robots. As smart as robots, they still depend on human beings to program them to be. This is a huge need for empathy, is think about what would people think, what would they like, all those.

Even those days when I designed any application and I would think, if the user sits in front of the machine, what would they like the next step? Then you make it automatic. All those things are empathy. That is so important.

But I found out in our education we don't normally focus on soft skills. It's called emotional intelligence. That is so important.

CAROLE: Yes. That could be a whole other program on its own, right Madge?

MADGE: Absolutely. I just want to give one saying. I love those sayings because I can remember them. Warren Buffett, a very successful billionaire, he said 90% of people's success is emotional intelligence. 10% is knowing how to do the job because if you got the right attitude, behavior, you can learn anything.

CAROLE: Wow. Which brings me to your book. You wrote a book several years ago, *The Innovator's Path*, published by Wiley, *How Individuals, Teams, and Organizations Can Make Innovation Business As Usual*. And it's a fascinating book. It's a how-to book, very, very practical. And I wonder if you could tell us a bit about the book and really what you think it means to be an innovator.

MADGE: First, I want to define innovation, because initially I was confused. I'd say, well, some people might be like me. So I say, innovation is not invention. You got to be genius, like Einstein. Those are inventors. Dean Kamen is inventor and all this.

But innovation is any change or improvements we make to increase or create more business value for the organization. That is innovation. Once I define so simple, many of my team members said, now you're talking, Madge. We didn't know what we have done is innovation. Absolutely

State Street, when I was managing the team, the team was so good. We keep using new technology because they are better, faster, cheaper. So we were able to not only give the capability to the company's business, we also create a lot of expense savings for the company.

That is huge impact. If you calculate the expense savings equivalent to the amount of revenue, then you can calculate earnings per share. That's shareholder value. And so that's how important innovation is.

So I defined, everyone can be innovative. But then I realize throughout my career, I know so many people that are innovators, but some are successful, some not so. This is why I concluded through my many, many years experience there are disciplines some innovators have. That's why they are successful. And then trim it down to eight major ones-- listen, lead, position, promote, connect, commit, execute, evolve. And that has been proven true every time.

CAROLE: You think that your book has some lessons for young people as well who are trying to determine how to make an innovative path for themselves?

MADGE: Absolutely. I make it very simple. Let me explain how do you explain to anyone about listen. Listen is all you listen to the market, to customers.

Use pandemic. Market change, customer change. They don't come to the restaurants, so restaurant has to make changes, how can they survive. A lot have survived. They do take out immediately and a lot have closed because they cannot change or they're not willing to change.

Then you a lead. Lead is a vision for tomorrow because you should always say, what about tomorrow. Today, you know you're doing it. How about tomorrow? So you will looking forward to what's next step. And once you got a vision, how do you position it strategically. Some restaurants, immediately when pandemic came, they do take out immediately, curbside, delivery, all that. They survive really well. But some reacted until they were almost go bankrupt. Then they said, oh, maybe we should do something. But that's a little late.

And promote, once you're positioned, you got to promote. You got to let people know where you are, what do you serve, what's good about it. Let people know about it as widely as you can.

And then networking, that is so important. With social media, this is so important to network, globally even. You don't even have to be physically there and you can do that. Connect, I call.

And commit. Commit is once the direction, you can't be wishy-washy. You got to fund it. You got to get the teams together, resource funding, all that stuff, and make it happen.

The next step, of course, naturally is execute. You make it happen. Japanese has a saying, say, vision without execution is a daydream. Execution without a vision, it's a nightmare because if people don't know the common direction, they will execute all different directions.

Like a boat, you need to row the same direction. You can't have everybody row different direction. You never get there. So that is so true.

And once you execute, a lot of people stop there, say, oh my God, we just did a big project. My teams often told me that Madge, give us a break. We just finished this huge project.

And I usually try to host a big party celebration, and during the party I always say, OK, who has the next idea of innovation. And some people would say, oh, I've been thinking about it already, or that they know we can't stop there because we need to keep moving. By evolve, it's called. And pandemic was the best example to prove these disciplines are so key.

CAROLE: Yes. Yes, and change is constant, as you said earlier. So we have to continue to evolve. So Madge, you've had the most extraordinary career and you have so many incredible lessons learned and you've had a tremendous impact on the STEM field. What would you say would be the words of wisdom that you would leave for our listeners or their children or their students who might want to follow in your footsteps?

MADGE: Yes. I have been giving a lot of speeches. Every time, people ask me similar questions. And the way I kind of summarize to very simple-- I don't want to go too many points. Then they get lost.

So simple, number one, everybody should pursue your so-called dream job, what you're good at, what you like, rather force them to become engineers if they have no interest. Passion is so important for everything they do because I look at a job is not a job. Doesn't matter you're an entrepreneur or you work for corporation. It was my life and I put wholeheartedly into my job, and so you better do what-- I know every day I spent, it was fun.

I remember my alarm clock, when I would get up and run downstairs, my husband always said, why don't you hold on the railing rather than run, because I was so excited what I'm going to run into because problem doesn't bother me. It gave me a chance to solve it. The satisfaction is fantastic I just look for that kind of a thing.

So people, if they do their dream job, it doesn't become a job. They will have passion for it. That's the key. So it doesn't matter what they do. Technology is always a part of it.

So I'm not too worried about the fear that is still there. The ... even building homes. Now there are a lot of prefabricated and all the things automatic. They have machines help them and all that. So it doesn't matter what they do.

Own your own career. And if you did not do well don't say, oh, somebody stole my credit, someone-- no, it wasn't their fault. You should ask yourself, what could I have done better.

In my early career, I let people steal my credit. They get promoted. I hated them until that very wise executive told me I left it on the table. So own it yourself.

Another thing is be positive soft skills.... Be extremely positive. If they want a job they really like, don't walk in like they just woke up. Walk in, straighten your back, and positive, give a big smile and tell them that I'm so looking forward to be able to join this company, that I have been looking forward to and all that stuff. Let them know you got passion.

This is why in a couple of minutes I know if I want to hire the person or not because I use called ABC-- Attitude, how they walk in, shake hand with me; Behavior, B, how they answer the question, how they introduce themselves and all that; and Communication is obviously-- communication is critical. And if they cannot communicate-- I usually like to ask, why should I hire you instead of 200 other people? And they sometimes cannot put a finger on one line.

What I look for is what's your differentiator, what's your branding. They should know that, what I'm good at. And sometimes the common answer, they say, oh, I work hard.

But everybody works hard. They all answer that question. That's a given. You don't work hard, we're not going to even bother to interview you. So that's very important, knowing yourself and work on soft skills. And keep your connect network. That is so important. A lot of times, especially if they're at the top, the hiring a lot by connection. In my book, I have 17 top leaders and successful innovators, their career paths, and so many good stories. How did they get into my book? It's a connection I've been keeping for all those years with people I knew.

And how do you keep connection? Gratitude. A lot of people use other people to get what they want. They dump those people, instead of thank them for their help. Be appreciative. There's a lot of good people will say, oh, so and so really helping me through my career and all that. It's so important to do that. A lot of successful people-- why they are successful? Because they don't forget who helped them when they were hard, and they pay forward also. And there are a couple of great sayings that I always remember. Those are great. They're simple, but they mean a lot more than words.

My parents always say, life is like a Ferris wheel. It will go up, up, up, up, then it will come down. So when it's going up, don't be in over your head, kind of proud, arrogant, all the bad things happen to a lot of people, when to you.

Be kind to people. You help. Always help people you can help. Mother always said, you may never have another chance to help them. Take the chance when they need the help. It's a blessing if you can help them instead of asking for help.

So when this Ferris wheel's come down, we all have our hard time. And then other people will help you, if they pay gratitude, if they remember what you did for them. Not everybody, but at least some people will do it. So that's really valuable.

Another one is one executive told me, Madge, the race is against yourself. Don't look at other people's career, be jealous. Look at other people's career, say, what I can do to improve them. What's their lesson? That's why I reach out to 17 top executives. Tell me your lessons in your career that make you so successful. There are a lot of really, really good stories, like Admiral Michael Mullen and my last State Street boss, Jim Phelan they have fantastic stories to tell. Those are the valuable ones.

And another one is I love to end my talk, give everybody the best is yet to come. So...you don't stop today because the best is yet to come. You can do better.

I love that line because every time I congratulate somebody's promotion or something, I always say, the best is yet to come. This is not your destination, it's your journey. It's just a one stop on journey.

CAROLE: Wow. Madge, so much wisdom. I've been scribbling along on my paper all of these wonderful lessons you have given. And I wanted to also just call out-- you did say that another great lesson that could be helpful to our listeners, to tell to their daughters, their students, you can do anything that boys can do. You can be great. And make sure that you have fun in doing it, which I think are two really important points.

I wanted to mention to our listeners that your book, *The Innovator's Path* is available on Amazon and other bookstores. I've read it. I've heard you speak. And I think it's just phenomenal and so inspiring. And I have to say, Madge, you are one of my great role models and I have learned so much from you through the time we've known each other. I wanted to mention, you also have been a part of the Boston Children's Museum, serving on our board, and now are an honorary trustee, which means so much to us. But I wanted to thank you so much, Madge, for this remarkable story today and all your great advice to our listeners and to their students and their daughters. And I really hope that people will stay in touch with you through your book and continue to find inspiration.

MADGE: Thank you, Carole, for giving me this opportunity. I'm just so honored to share. And you are everybody's role model. You weather the pandemic and leading your teams through all the most difficult times. I tell you, it's not easy at all and I really admire you.

CAROLE: Thank you so much.

MADGE: But thank you.

CAROLE: Yes.

MADGE: Thank you.

CAROLE: And we look forward to our continuing conversation. All the very best to you.

MADGE: You too. Thank you. Bye-bye.

CAROLE: Thank you. Bye-bye.

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OLIVIA (PRODUCER): That's it for today's episode of the Big and Little podcast. Stay tuned for more. And if you like the show, we hope you'll subscribe and give us a review.