



Margaret Anderson Kelliher, Minnesota High Tech Association President and CEO

Developing a full range of STEM talent is critical to continued high tech growth in Minnesota

A Civic Caucus Focus on Human Capital Interview

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Present

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Summary

According to Margaret Anderson Kelliher of the Minnesota High Tech Association (MHTA), by 2020, Minnesota will need an additional 80,000 to 180,000 people with science, technology, engineering and math (STEM) degrees to fill newly created jobs and to replace retiring baby boomers. She calls the challenge of finding the talent companies need one of the top issues affecting growth of companies in our state and region, particularly related to technology jobs and basic-science jobs. She says workforce training must be our most important area of focus in order to meet MHTA's goal of Minnesota being in the top five science and technology states in the country.

Since the birth replacement rate won't fill all of these jobs, Kelliher says, we can't afford to lose people along the way. She believes we suffer in the STEM area from the "super-bright student bias," often focusing only on the top students who can qualify, for example, for the highly ranked University of Minnesota's engineering program. But we must also identify people in the middle with good skills and aptitude, who can complete two- or four-year STEM degrees in Minnesota State Colleges and Universities (MnSCU) institutions, are more likely to stay in Minnesota after graduation and can have successful careers.

Kelliher believes we must do a better job of exposing people to the variety of job and training opportunities in STEM fields. That includes bringing people from high-tech businesses into the classroom to tell students and their parents what they do, taking students on tours of high-tech companies and providing more high-tech internships for high school and college students. She discusses several programs outside of the state's postsecondary system providing these opportunities and alternative job skills training.

As a member of MnSCU's board of trustees, Kelliher says the biggest challenge facing the system is its low completion rate for students, whether they are pursuing certificate programs, two-year degrees or four-year degrees. This is expensive for the individual, for the state and for the system, she says. Retaining the number of students who enter the MnSCU system would solve the system's budget and enrollment issues, she asserts.

Biography

Margaret Anderson Kelliher is president and CEO of the Minnesota High Tech Association (MHTA). Together with the association's nearly 350 member companies and organizations, Kelliher works to fuel Minnesota's prosperity through innovation and technology. United behind a common vision to make Minnesota one of the country's top five technology states, MHTA members represent various technology sectors, including IT, biosciences, advanced manufacturing, clean, green and education technology.

Prior to coming to MHTA, Kelliher served in the Minnesota House of Representatives (DFL-Minneapolis) from 1999 to 2010, including two terms as Speaker of the House. In 2012, she was appointed to the Minnesota State Colleges and Universities (MnSCU) Board of Trustees. She chairs Gov. Mark Dayton's Broadband Task Force and teaches at the University of Minnesota's Humphrey School of Public Affairs. She serves on the board of directors for the YWCA of Minneapolis, the Greater Twin Cities United Way and Textile Center of Minneapolis.

Kelliher has a B.A. in political science from Gustavus Adolphus College. She earned her master's degree in public administration from the Kennedy School of Government at Harvard University.

Background

Since issuing its [statement on human capital](#), the Civic Caucus has concentrated on learning more about the continuing need for a strong workforce in Minnesota in the coming years. The Civic Caucus interviewed Margaret Anderson Kelliher about the role of the Minnesota High Tech Association and its members in advocating for and helping to provide education and training for the highly skilled workers needed by the state's high tech industries.

Discussion

The Minnesota High Tech Association (MHTA) wants Minnesota to be in the top five science and technology states in the country. MHTA President Margaret Anderson Kelliher said science and technology education continues from early learning all the way through to higher education. "With early learning, we've learned so much in 20 years about how children learn," she said. "From 100

years ago, we've come to a radically different understanding of children and how their brains take in information. The investments in early childhood and pre-K education are critically important to get to the workforce of the future."

There is great debate in higher education today, she continued, over whether we're educating for a job or for a life. "I would say we're educating for both," she said. She said that applies to early childhood, as well, since young children are learning both the fundamental skills for operating in the world and things that will make them more receptive learners.

At MnSCU, education technology is becoming more important. Ten or 20 years ago, Kelliher said, people thought new technology in education was going to be a new way of delivering education to students online. But, she said, the most successful model is a hybrid model: a human touch model, with delivery of content online, as well. "The hybrid model has in many ways become the preferred model," she said.

The most interesting development is the use of data in education. Kelliher said the ability to capture and integrate large data sets will change the way we can help students along the way. An example in higher education is "intrusive advising," which is the use of data to help monitor where individual students are academically and whether they're showing up for class and doing their assignments. Students then have contact with an advisor or counselor to check in and help them stay on track for success. She said students have a much higher rate of getting to completion when that type of monitoring happens. "And the number-one thing is completing college, whether a four-year degree, two-year degree or certificate program," she said.

With its goal of becoming one of the top five science and technology states, the MHTA is focused on four main areas:

1. **Workforce:** Pre-K through job retraining, college, advanced degree and other types of workforce development.
2. **Entrepreneurship:** There is a high correlation within our 350 member companies of traditional entrepreneurship and company formation, and of entrepreneurship in large organizations with creating new products.
3. **Innovation:** MHTA has presented the [Tekne Awards](#) for the past 15 years, which celebrate innovation in Minnesota.
4. **Public policy:** MHTA supports policies that support and encourage a science- and-technology or knowledge-based economy in Minnesota.

Data about the workforce and what will happen to it in the future is troubling for science and technology. "But we have a problem today," Kelliher said. "One of the number-one issues affecting growth for companies in our state and region is the talent issue, particularly related to technology jobs and basic science jobs. People still love it here and companies want to grow here. But one of the biggest breakdowns is not being able to find the talent you need." She said available investment dollars here are also an issue, but finding, attracting and growing the right sorts of talent here are bigger issues.

By 2020, Minnesota will need between 80,000 and 180,000 additional people with degrees in the science, technology, engineering and math (STEM) fields to take newly created jobs and to

replace retiring baby boomers. The 80,000 estimate is from [Minnesota Compass](#) and the 180,000 estimate is from a [Georgetown University study](#). "The ability to just grow your own workforce probably doesn't work as the only strategy," Kelliher said. Other strategies include attracting more people from other states to Minnesota and retaining them here. "It also means true immigration reform that helps attract and keep people in these highly specific areas," she said.

In the U.S., the birth replacement rate won't fill all of the jobs, so we can't afford to lose people along the way. "We need to find a way to help students get connected," Kelliher said. For example, there are students who have aptitude, but not the skills necessary to go into the engineering program at the University of Minnesota (U of M). She said we can't depend on graduates of the U of M's highly ranked engineering programs to all stay in Minnesota. Nor will the program produce enough engineers to fill all the jobs here in the state. But graduates of the engineering programs at places like Minnesota State University-Mankato, St. Cloud State University and the University of St. Thomas are more likely to stay in Minnesota, she said, and by working together to retain all those students we can meet the gap.

We suffer in the STEM area from the "super-bright student bias." Kelliher said, "We have a bias toward the genius. But we must also identify people with good skills, who wouldn't qualify for the U of M's engineering school, but who could very easily get a two-year degree at a community and technical college in the STEM fields or a four-year degree in that area and have a really successful career." She said culturally we have this issue, and it is reflected in the K-12 school system and the colleges.

"We need to beef up the middle, both how we think about the middle and how we teach to the middle in terms of these math and science skills," Kelliher continued. She believes it's difficult, because, for example, students can graduate from high school taking only three years of math. "Maybe we should expand the definition of what years three and four could look like for high schoolers," she said. "Why can't computer-programming classes count as a math requirement in Minnesota high schools?"

Things have changed: now technology is everywhere. Kelliher said technology is wherever businesses are. "It's an enabling technology," she said. "That's why it's troubling if we don't have an adequate source of talent."

She said an MHTA survey of businesses released in mid-November shows that businesses are saying that what's unique about Minnesota is that we have a much more diverse set of technology industries in the state. "It's why, even though the recession hit a lot of Minnesotans very hard, the recovery was much faster than elsewhere," she said. "That's because of the diversity we have in this area. We're not Silicon Valley and we're not just about the medical-device industry. We're also about health-care technology because of the health-care companies we have here. That's a really fast-growing area in Minnesota. Educational technology is also remarkably strong here."

We must make our own population aware of what's available in the STEM fields. MHTA is doing two things in this area:

- Over six years ago, MHTA started a portal for teachers and businesses to be able to exchange both goods and speakers: the [GetSTEM of Minnesota website](#). Kelliher said the website helps K-12 teachers and business people make a connection to have speakers come into the

classroom to talk about what they do or for businesses who might have things to give away that could be helpful to teachers.

- Another important effort is MHTA's [SciTechsperience internship program](#), which connects college students studying STEM disciplines to paid internships in small to mid-sized entrepreneurial Minnesota companies. The program is part of the Minnesota Department of Employment and Economic Development (DEED). MHTA created the program, using a grant from the state.

Kelliher said last year the program placed 117 paid college interns at small and mid-sized science and technology firms across the state. Forty-five percent were placed in rural Minnesota. "The idea is to build student awareness," she said. "We wanted to expose students and attract students back to the state so they can have a real work experience." Over the past three years, almost 250 interns have been placed.

An interviewer commented that high school kids must also become exposed to the type of work done at high tech companies, so they could get interested and perhaps go to technical colleges to train for that work. "It's got to be more applied," Kelliher said. She said the GetSTEM program includes a speakers' bureau and can include visits to companies. "There's too much of kids doing only what they've been exposed to," she said. "Part of what's needed is breaking that cycle. Students often pursue only what they're exposed to."

"Does that mean bringing tech education back into the high school realm?" she asked. "Or is there some way of sampling things with less than a four-year degree?"

Kelliher singled out as a successful program Genesys Works, based in St. Paul, a college-access program for low-income students. She explained that during the summer before their senior year in high school, the program trains students in basic technical help-desk skills. It also works on developing the soft, or foundational, skills of employment. The students work throughout their senior year in high school, earning money for college. The program helps students apply for college. Kelliher said the technical training is also helpful to the students throughout college. "It's a successful model a little different from apprenticeship programs and includes a lot of contact with the students," she said.

Kelliher said highlights of major legislative proposals related to the talent issue she sees coming for the 2015 session include:

- Funding for higher education, especially related to science and technology at the U of M, MnSCU and the private, nonprofit schools.
- MHTA will be asking for more money for the college internship program, which has cost \$800,000 in the last two years for 250 interns. State funds partially subsidize small for-profit companies for paying an intern up to \$5,000.

- MHTA will be making proposals and giving support to some existing things it thinks are important to Minnesota's business climate: the angel investor tax credit to bring more capital into the state and the research and development tax credit, which is one of the best in the country.
- State Senator Terri Bonoff will have some proposals related to apprenticeships.

An interviewer asked Kelliher if she's comfortable that these proposals are the best things we could do to address the workforce shortage issue. "They're really good proposals if we're thinking of things the state can influence," Kelliher said. "But we need industry-driven ideas, as well. But these proposals don't address federal issues like comprehensive immigration reform that gets to the need for high-skilled workers."

Another interviewer asked if there is legislative support for these proposals. Kelliher replied that the state has a healthy budget balance, so it's easier to look at investment in higher education. That includes a focus on student debt, because legislators are sensitive to how quickly that's spiked in Minnesota. "Overall, she said, "we've seen a positive response bipartisanly to issues around the workforce, especially getting students into places where they're having hands-on experiences."

A partnership between Hennepin County and Minneapolis Community and Technical College (MCTC) is an innovative way of matching students to available positions in the county. Kelliher said Hennepin County Administrator David Hough has partnered with MCTC Associate Vice President of Workforce Development Mike Christenson to use a tool in the MnSCU system called [Wanted Analytics](#). The tool helps people analyze their current resume and skill set and helps them match their current skills to available Hennepin County positions.

Kelliher said Hennepin County is one of the largest employers in Minnesota and faces significant current and future retirement issues. The county wants to fill those positions and diversify their workforce, she said. Hough found that many of the positions within the county have evolved to the point that a four-year B.A. degree is the entry point. "Working with the county board, the administration was able to move many, many positions to a two-year A.A. degree as the entry point," Kelliher said. "It's an innovative way of matching students into Hennepin County and helping them gain the foundational soft skills and work skills to lead to a job." She said the county is also working with [Project for Pride in Living](#).

The workforce training area is the most important area to focus on. The federal [Workforce Investment Act of 2013](#) gives us an opportunity to rethink that whole area, Kelliher said.

MnSCU is the largest generator of the higher education population in Minnesota, but its number-one problem is the completion rate for students. "We have too many students who enter into our two-year or four-year colleges and don't complete," Kelliher said. "That is an expensive proposition for the individual, for the state and for the system." She pointed out that it's more costly to complete a degree at a later date and allows the accumulation of student debt. Also, she said, it raises the issue of developmental education, when preparation not been strong enough in the K-12 system to support college work. She said MnSCU's number-one challenge is helping students complete their degree within two to six years. If MnSCU retained the number of students who enter, it would solve many of the system's budget and enrollment issues, Kelliher maintains.

The second big issue for MnSCU, she said, is getting students who don't think of themselves as college-bound to come to the two-year higher education institutions. "How do you get into a role you haven't been exposed to in high school or in your family life?" she asked. She pointed out that health care has a great laddering system, where people can keep moving up, but it's harder to see that pathway in technology, where many companies want a four-year degree in engineering, math or a technical area. "We have to do a better job as a system in helping people get started," she said.

Some of the problems around MnSCU's "Charting the Future" plan revolve around the fact that higher education is going through some of the biggest growing pains it's had in years. Kelliher said people are expecting greater delivery on value and people disagree whether we are educating a person for life or for a job. "I think we're educating people for both," she said. "It's very unlikely that people will stay at one job for 30 years. They will need the flexibility of skill upgrades and developmental soft skills to be able to navigate that world."

"I reject the idea that we should only be educating for education's sake," she said. "I don't know people who go to college and say they don't want to have a job when they come out. People want to contribute; they want to work. We need to help people mature into productive citizens and also to be employed."

Thirteen of the top 50 occupations for which U.S. H1B visas are granted are technology-related jobs. All of the top five are technology related. (H1B visas allow foreign workers to enter or stay in the U.S. to work in specialty occupations.)

MHTA has been working with CompTIA , the largest certifier of technology programs in country, to start focused information technology (IT) boot camps. Kelliher said the White House Office of Science and Technology Policy is interested in helping some regions around the country start IT boot camps focused on harder-to-employ people, like returning veterans and people in job training programs like Project for Pride in Living.

Building on this White House program, Twin Cities-based custom software company The Nerdery has just launched Prime Digital Academy , a school for software engineers. Prime will feature an intense, immersive, accelerated program to help learners get up to speed for entry-level jobs in software engineering. It is partnering with the City of Minneapolis, MHTA, the Creating IT Futures Foundation and Jewish Family and Children's Services of Minneapolis to make public and private funding available for qualifying students who otherwise would be unable to attend.

Kelliher said the Twin Cities will be one of only a few places around the country to pilot one of these focused IT boot camps. Half of the students will pay for the program and about half will be harder-to-employ people who have not had success in the workforce. She pointed out that the program will be delivered by private industry, which gets to the issue of the responsiveness of the higher education systems. "It's been hard to watch that the systems have not been as responsive as industry needs," she said. "That's why this is happening."

A greater percentage of people in Minnesota will have to create their own companies and their own jobs. Kelliher said MHTA acquired and offered a venture capital conference last year (The Minnesota Venture and Finance Conference, formerly offered by [The Collaborative](#)), which brought

people together regarding investment in companies. Thirty-two companies were pitching their investment attractiveness at the conference. Forty percent of the companies were medical-technology companies, forty percent were tech companies and 20 percent were other industries, like food companies.

Kelliher said MHTA is working on program ideas around entrepreneurship and on bringing more students to next October's MHTA venture capital conference to show them what company formation looks like. "We don't have a strong enough culture around the idea of 'This is what it looks like to start a company,'" she said. "We need to get students more interested in company formation. This is something industry can be the leader on. This is not something government can tell you how to do. This is something you need entrepreneurs to be able to help you with."