EPICMN LISTENING SESSIONS REPORT

At MnTech's Tech Talent event on Friday, October 27th, the Expanding Pathways in Computing (EPICMn) track included sessions on K-12 computer science education in Minnesota. During the last session, feedback was gathered from community members representing K-12 computer science teachers, K-12 school leaders, informal learning providers and others. This report summarizes their feedback.

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About CSforAll-MN

csforallmn.org

Computer Science for All Minnesota (CSforAll-MN) is a collaborative effort by leaders in education, industry, nonprofit organizations, and higher education institutions from across Minnesota dedicated to advancing equitable computer science education policies and opportunities for every K-12 student in the state.

Partners

The EPICMn event was made possible through the collaboration and financial support of our partners, MnTech and the Expanding Computing Education Pathways Alliance.

CS HIGHER EDUCATION

2023 Listening Session Feedback

Feedback was gathered from community members at the 2023 EPICMn / Tech Talent Summit on Friday, October 27, 2023 about key areas to inform state computer science (CS) education policy

What Has Been Done or Can Be Done

- Motivating the faculty to work on new programs or certificates.
- Widening the pipeline to broader disciplines such as information technology and cybersecurity versus application focused CS.
- Creating interdisciplinary CS programs to engage students outside of the standard CS degrees.
- Partnering with other organizations to create intern opportunities and to teach basic coding to underprivileged populations.
- Documenting the K-12 CS journey in Minnesota and highlighting the success over the past 5 years.

Challenges

Participants identified finding credentialed instructors as a primary challenge for CS higher education programs. It is hard to compete with the industry for job candidates. One suggestion included recruiting adjunct instructors from industry.

Areas for Collaboration

Institutes of higher education can collaborate to help advance K-16 CS education in the following ways:

- Establishing common learning outcomes and competencies across higher education programs.
- Supporting formal education support role in school districts.
- Building business and district partnerships to align and define skill needs.
- Building professional development programs for in-service teachers.
- Integrating CS into pre-service teacher programs for K-12.
- Starting to build the foundations for CS in elementary schools.

Help Needed

- Funding for new initiatives
- Stackable certificates, degrees, and pathways to careers

WHO

CS/STEM faculty and administrators from institutes of higher education

ROLE

Higher education faculty and programs provide advanced education to prepare students for a wide range of careers in technology

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K12 SCHOOL LEADERS

2023 Listening Session Feedback

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How can we learn more about existing frameworks to support CS integration, including non-traditional school pathways as well as a CS Scope and Sequence?

ChatGPT + AI + Python + Swift are some of the current buzzwords and educators need help making sense of the programming languages and cognitive skills applied across platforms/tools. Even more so, school leaders want support on how much should be taught each year with clear teacher expectations. Furthermore, educators want support on how to incorporate work-based learning activities/programs into CS pathways.

What is my role as a CS school leader and how can I grow professionally?

Some confusion about roles in schools exists as a participant stated, "We started this and we want other people to learn, but currently twisting in the wind? What is next for me?" Educators want to know more about pathways for licensure and who is included in the career trajectory. Finally, it is unclear how school leaders, such as Directors of Teaching and Learning, can review courses, change course content as it evolves and what CS standards should be adapted into course curriculum.

How can we continue to train and support staff while making professional learning sustainable?

School leaders want to know more about instructional coaching and engaging colleagues in high-quality professional learning. Participants had questions about access to funding, where to find qualified providers, and how to strategically meet their staff goals while also addressing their strategic school plans.

How can school leaders create benchmarks for success and celebrate small and big wins?

The group of participants expressed excitement about the quick timeline of the state's CS working group, and continuing to integrate culturally relevant pedagogy into existing CS activities. The group further showed excitement about creating benchmarks, CS standards and growing legislative support. This excitement led to questions about how to celebrate the launch of course offerings for students and scale their wins district wide.

Who is currently teaching CS, who should be able to teach CS, and what they should do

Participants felt that all teachers should be able to teach CS and in some ways, all teachers already teach computational skills, they just need to realize it. In most cases, Science, Math, and Business teachers, as well as media and ed tech specialists currently teach CS. Participants want to know how they can get help in developing their portfolio, present their conceptual understanding of concepts and topics (or via a test pathway) so they can obtain their licensure. Participants also discussed the teacher apprenticeship program idea – PELSB – pathway to teaching license (teacher shortage) as a way to grow our existing educators and preservice teachers.

Licensure Recommendations

Group participants expressed interest in skill based and interest based CS licensure via multiple pathways (2 year degrees, test options, or experience). Importantly, participants expressed a need for sponsorship support and access to resources. The group asked for clarity on re-licensure as a separate category, or whether it should be integrated into the tech category, as well as utilizing work-based learning in order to create capacity from within.

WHO

6 school leaders from K12 public and tribal schools

ROLE

School leaders make decisions about budget, what courses are offered, who teachers courses, and support state reporting systems.

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K12 EDUCATORS

Assets + Challenges

There are already many teachers in Minnesota doing great work in computer science education. These teachers tend to be early adopters, however, with little coordination at the state level.

Challenges include:
- Budget - for hardware, teacher PD, and infrastructure
- Teacher capacity - teachers are already stretched very thin and CS classes are likely to add additional preps
- Varying hardware and Internet resources at schools
- Funding and resources can be hard to access for rural and smaller schools
- The rapid pace of technological change means that there is an ongoing need for teacher training and budget for classroom supplies
- Lack of awareness at the district level

Recommendations

1. Ensure broad access to grant funds

It is important to ensure that grant funds are thoughtfully distributed to a variety of districts. There should be significant outreach beyond the district level and there should be ample time for applications.

2. Provide flexible options for licensure

Alternate paths to licensure should be provided to teachers who are already delivering this content - it should be *significantly* more accessible than the current portfolio system. Training should be flexible and accessible online.

3. Standards should reflect classroom reality

In many schools there is limited budget for hardware and teachers may not be able to install software. Some districts, especially rural ones, may not have consistent Internet access. It's important that standards be accessible to all Minnesota classrooms and that there is investment in infrastructure to support standards delivery.

4. Flexible professional development

It is important that professional development not be tied to specific platforms or hardware that schools may or may not have access to. Teachers should have a lot of autonomy to choose professional development opportunities that take into account their current level of understanding and their classroom needs.

WHO

10 K12 teachers from public and tribal schools with two CSTA-MN facilitators

ROLE

K-12 teachers will be in the computer science classroom every day. It is vital that we consider the input of teachers and take into account the realities in the varied classrooms across Minnesota.

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COMMUNITY

Assets + Challenges

Participants identified a number of existing assets and supports to overcome challenges. Challenges included finding time within the school day for computer science (CS), creating standards for CS, ensuring equal access across communities, and more.

Strategies included engaging students through hands-on and project-based learning, providing access to professional development opportunities, technology and internet resources,

Community-based learning through out of school programs and organizations can help alleviate the burden of including CS in the school day if done equitably

WHO

8 participants representing non-profits, industry foundations, museums, and others that center informal learning.

ROLE

Informal learning opportunities can help alleviate the burden of including CS in the school day, if it is done equitably. These programs also have experience in involving parents and families in meaningful ways, based on their backgrounds and cultural persepctives.

Recommendations

1. Funding / Financial

Funding for informal learning programs tends to be very inconsistent as they come from corporate sponsors or granting agencies. The group recommends that this becomes a priority through state level funding so these sorts of programs can flourish consistently.

2. Access

Our group identified that access has multiple meanings such as access to hardware, software, transportation to and from programs, as well as resources. The group wants to prioritize access in these different ways.

3. Communication / Dissemination

Our group agreed and understood that sharing information across different programs is a necessity. However, this is sorely lacking as there is no consistent way or platform for outreach across programs. Our group pondered about creating a map or network to crowdsource programs as well as their impacts.

4. Informal Learning

Our group discussed the benefits of informal learning programs as they tend to be a bridge for connecting those students to formal settings (and eventually pursuing CS more seriously). Our group also discussed that understanding what informal learning is could be helpful to building more collaborative relationships and partnerships.

5. District-Based Learning

including CS might be a challenge in certain districts given time constraints, schedules, priorities, standardization, infrastructure and role models (especially those in rural areas with less physical access to resources or diverse representation). More attention should be paid to students in these areas and all districts, so bridging relationships, industry partners, and more community programs equally (not just in the cities), is crucial.

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