Tuesday, May 14, 2019 3:00PM

Thank you Chair Terhar, Vice Chair Lehner, Ranking Member Fedor and members of the committee.

My name is Kelly Gaier Evans and I am a STEM Relationship Manager on the Education team at Battelle. I am here to testify in support of an amendment to HB 166.

Battelle is keenly aware of the powerful and growing role computer science plays in the future of American technological advance. Battelle is world's largest, independent, not for profit science, research and discovery organization. We manage the Oak Ridge National Laboratories in Tennessee, which built today's fastest supercomputer, Summit and is building Summit's successor, a supercomputer more than 50x faster than any running today.

Not far from this room, Battelle's cybersecurity team in Ohio works on protecting our clients from digital threats. The division is one of our fastest-growing teams, with 34 open job postings today.

A solid understanding how computers are designed, how programming works, and the fundamental structure of digital systems, is essential to even more jobs at Battelle. Our Cyber team is hiring for 34 jobs, but there are another 70 jobs open for applicants with "computer science" skills. You have likely heard the same stories from the businesses in each of your districts.

Foundational knowledge of broader Computer Science is critical for success in today's world. Every 21st century student should have a chance to learn how the today's digital world works. Computer science builds. It creates. Students deserve to learn how to create algorithms, how to make an app, and how the Internet works.

Parents and even students understand that these skills matter. The reality is that, in most schools, it doesn't matter how many students are interested, there is no class available. Why? Because there's no teacher.

With partners across the state, I am working to change that. I work for Battelle's STEM education team. In 2016, Battelle Education, as the backbone organization for the Ohio STEM Learning Network, was selected by the national non-profit Code.org to increase the pipeline of Computer Science teachers in Ohio.

To date, we have prepared 152 middle and high school teachers to bring Computer Science courses to their students. This year, these teachers have reached almost 9,000 (8,895) students. By the way, 40% of these students are young women. In fact, since 2016, Ohio has almost 3 times the number of female students taking the computer science AP exam and over 4 times the number of minority students taking a computer science AP exam.

Our approach gets students in computer science quickly by creating a new path for passionate educators to get into computer science education. We recruit teachers in the classroom for an intense, year-long professional development. Over the summer and Saturdays, we are building a new core of

dedicated teachers. Many of these teachers are the first to bring computer science classes to their schools. They are blazing a trail for their students and the economic health of their communities.

But they face a major problem. As written in law and interpreted by the Ohio Department of Education, these students taught by these teachers cannot receive credit for their AP Computer Science course.

REQUEST
Our proposed amendment would allow a licensed middle school or high school teacher who has completed an endorsed professional development program for AP Computer Science Education to teach AP Computer Science Education. The program they complete would be required to earn endorsement as currently described in law by the College Board (or its equivalent).

CURRENT STATE
Currently, law (3319.236) only allows AP Computer Science course to be taught by licensed educators who have both completed a College Board endorsed program and also completed a secondary licensure program for computer science.

The current web of licensure programs is complicated, which I have described in detail in a memo to this committee. In short, our state's current options for teachers are either misaligned with modern approaches to computer science education, are designed for industry professionals, or impossible for working adults.

Of the current pathways:

- One graduated no applicants in 2016, the most recent year we have received data
- Another is built for technology educators and includes learning standards like "typing" and "using the Internet"
- And the third requires a lengthy exam aimed at evaluating teachers for teaching advanced programing concepts.

HOW THIS AMENDMENT WOULD MODIFY CURRENT STATE

Our change would maintain the requirement for a valid Ohio educator license for grades 7th through 12. Prospective teachers would also need to complete an endorsed professional development. After that completion, they would then be allowed to enroll students in AP Computer Science.

One such program would be Battelle's partnership with Code.org for a course we call CS Principles. This program has earned approval from the College Board, qualifying it under 3319.236.

CS Principles offers a multidisciplinary approach to teaching the principles of computation. Teachers learn how to introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. CS Principles also gives students the opportunity to use current technologies to create computational artifacts for both self-expression and problem solving. The goal of the course is to broaden participation in computer science. It is specifically designed to successfully prepare teachers for computer science without prior experience.

We prepare educators to offer CS Principles as an Advanced Placement course, where students finish by sitting for the AP exam and have the opportunity to earn college credit.

WHY IT MATTERS
Last year, only 37% of school districts in Ohio offered at least one high school Computer Science course – leaving students in the other 63% of districts without access to a single course. Furthermore, only 141 schools in Ohio offered an AP Computer Science course.

We have been moving in the right direction. From 2016 to 2018, the number of Ohio schools offering AP Computer Science grew from 82 to 141, nearly doubling in just two years.

That increase has been driven by programs like our partnership with Code.org and other high-quality professional development efforts, including those created by Cleveland State University.

This work addresses the central problem principals report stops them from offering any computer science: They lack prepared and licensed computer science teachers. In a multi-year Google-Gallup study of Ohio K–12 principals, 56% indicated there were no teachers available at my school with the necessary skills to teach computer science.

It will not surprise this committee to hear that this barrier hits some communities harder than others. Wealthy suburban neighborhoods can afford to hire and keep a licensed CS teacher. Urban and rural schools often lack the resources to compete for the small pool of licensed and prepared CS teachers. In that same Google-Gallup survey, 55% of Ohio principals reported there was not enough money to train or hire a teacher.

The change we discuss today would not solve this funding gap. However, it will foster the continued growth of programs like ours. Programs that take experienced, licensed educators and teach them new skills. That allow these educators to offer classes in one of the state's most important subject areas.

Without this change, Ohio faces years where only the most advantaged schools can attract computer science teachers. This will unavoidably mean thousands of students—particularly those from underrepresented backgrounds—graduate without ever even the chance to learn programming, algorithms, or broadly how our modern world works.

I commend the bill's sponsors for raising this critical issue and urge you to consider this proposed amendment to build on its impact.

References:

AP Program Participation and Performance Data 2018 – Research (n.d.). College Board. Retrieved from https://research.collegeboard.org/programs/ap/data/participation/ap-2018

Trends in the state of CS in U.S. K-12 Schools (2016). Google and Gallup. Retrieved from https://csedu.gallup.com/home.aspx

Do I need specific experience to teach AP Computer Science Principles? Retrieved from https://apcentral.collegeboard.org/courses/ap-computer-science-principles/course/frequently-asked-questions/do-i-need-specific-experience-teach-ap-computer-science-principles

Ohio Higher Ed Education Program Finder. Retrieved from https://www.ohiohighered.org/education-programs/program-finder

Wright State University Academic Catalogue: Multi-Age, Computer Information Science Licensure. Retrieved from: https://catalog.wright.edu/preview_program.php?poid=5487&catoid=7

MEMO: Ohio's Computer Science Education Licensure Pathways

Pathways for Teachers

Number 1: Hold a valid educator license in computer science ORC: 3319.236 & 3319.22

The first path is to hold a valid educator license in computer science. Wright State University is the only university in Ohio to offer a computer science licensure program. The program is designed for full-time study and internship, Monday through Friday. We have struggled to get accurate data on this pathway. In the last year we have data, 2016, this program graduated 0 new licensure candidates.

Number 2: Hold a license endorsement in computer technology and a pass a content examination in the area of computer science. ORC: 3319.236

The second path is to hold a license endorsement in computer technology and a pass a content examination in the area of computer science. This path was created for "computer technology" educators and built on learning outcomes like "typing" and "using the Internet." These can be useful skills, but that's very different from understanding how programming works. The Ohio Department of Higher Education and the Ohio Department of Education have a committee to build a new standard for the teaching endorsement specifically focused on computer science. We anticipate it will take several years until this endorsement is defined, professional programs are created and approved, and teachers are completing this endorsement.

Number 3: Hold a valid educator license in any grades K-12 and meet the requirements for a supplemental teaching license for teaching computer science. ORC 3319.236, 3301-24-14 & 3319.361

The requirements for the supplemental teaching license include passing a content examination in the area of computer science. The Ohio Department of Education announced the OAE 010 Computer Information Science exam in the late winter/early spring of 2019 but they also have convened a committee working on adapting this exam to align with newly adopted Computer Science standards.

Pathways for non-educators

Number 4: Twelve/forty hour temporary teaching permit for qualified non-licensed individuals
Finally, there is a pathway for people from the computer science industry to become educators. The permit allows a non-licensed individual to teach for up to 12 hours a week (40 in a STEM school) if they hold a baccalaureate, master's, or doctoral degree in Computer Science, or show evidence of significant experience, as verified by the employing district, in CS. ORC: 3301-23-41