Proponent Testimony – HB 33, amendment SC1252x1

Chris Orban

May 25, 2023

Members of the Senate Finance committee—my name is Chris Orban and I testified on the topic of Computer Science Education in HB33 in front of the Senate Workforce and Higher Education Committee on May 11. During that hearing I was encouraged by one of the committee members to also testify to the Senate Education Committee, which unfortunately I was not able to do, so I am submitting this written testimony and I hope to also present oral testimony to the Senate Finance Committee before HB33 is ultimately voted on.

As a disclaimer, although I testified on Computer Science Education, I am **not** a part of the Computer Science Advocacy Coalition and although I am a faculty member at Ohio State University, I only represent myself in providing this testimony as a person with expertise on computer science education and who has experience serving on different committees with the Ohio Department of Education (ODE). In particular I have played an important role in the ODE-led discrete math pilot, as I will discuss.

First I want to make clear that **I fully support amendment SC1252x1 to HB33** which my colleagues in the Computer Science Advocacy Coalition have shared with me. This amendment describes funding for different purposes that relate to computer science education, and it describes policy changes that do not require any funding. My colleagues from the Computer Science Advocacy Coalition have already testified regarding this amendment in front of the Senate Workforce and Higher Education Committee as well as the Senate Finance Committee, so I do not feel the need to comment further other than to express my support.

Second, **I want to bring to your attention an important item that is mentioned in the 2022 State Plan for Computer Science** but that is not mentioned in HB33 or in amendment SC1252x1. In particular there is an **ongoing effort by the Ohio Department of Education to integrate computer science into high school mathematics**. To the best of my knowledge, **this effort will have a greatly reduced budget in the next cycle**, even as we try to ramp up computer science in Ohio. Specifically, these efforts involve courses called "discrete math" and "data science" and teachers do not need computer science credentials to teach them. These two courses are funded through a ODE-led project called **Strengthening Ohio's High School Math Pathways**. Most of the funding to support these courses have come from covid relief funds and so there will be a significant drop in support as these funds expire.

It is not an unreasonable point of view to think that amendment SC1252x1, which describes $12M per year of funding for three different computer science related programs, is "enough" computer science investment for Ohio's kids. But there are compelling reasons to invest in efforts to integrate computer science in high school mathematics that I will describe – chief among them is that **we need to be on a trajectory where every high school student in Ohio**

has an opportunity to engage with computer science skills. As I will describe, we are nowhere near that goal.

Reasons why integrating computer science into high school math is important:

1. Computer science in Ohio is not going well

For every 100 high school students in Ohio, on average less than 4 of them took computer science in the last year. This is according to data in 2022 State Plan for Computer Science. Data compiled by the group code.org show that the percentage of Ohio public high schools that offer computer science has recently dropped from 50% to 48%. **It is not even clear that the needle is moving in the right direction.** Efforts to integrate computer science into high school mathematics therefore address an important need.

2. There are not enough computer science teachers

According to data from the 2022 State Plan for Computer Science, there are roughly 1,000 computer science teachers in Ohio. According to my best estimates there are roughly 10,000 high school math teachers in Ohio. This means that if **1 in every 10 high school math teachers could be trained to teach a course like discrete math or data science, then the number of students significantly engaging in computer science skills in our state would double**. It is also true that as the number of public high schools offering computer science has dropped slightly, the number of math teachers teaching discrete math or data science has been rising exponentially. As mentioned, math teachers receive computer science training to teach these courses but they do not need to complete all the other requirements to become credentialed to teach computer science, which are considerable.

3. Discrete math and Data Science align to Ohio Computer Science Standards

Both the discrete math and data science courses have been designed from the ground up (and I can speak to this personally) to align with the Ohio Learning Standards on Computer Science which states:

*"The high school computer science standards provide both foundational and advanced opportunities districts can use to design as separate courses or, when appropriate, **integrate into other disciplines**."* Ohio Learning Standards for Computer Science Page 6

It is therefore reasonable to fund these efforts out of computer science dollars, not just "math" dollars.

4. Discrete math and Data Science are excellent recruiting tools for finding future CS teachers

Having personally interacted with teachers in the discrete math pilot, I can tell you that the experience has definitely helped many realize that becoming credentialed to teach computer science is not outside of their grasp. The 2022 State Plan for Computer Science calls for more

than five thousand new computer science teachers. It is not very likely that most of these teachers will come from industry.

5. Ohio is a national leader in integrating computer science into high school mathematics

When I testified to the Senate Workforce and High Education Committee on discrete math and data science, I was joined by Zarek Drodza from the University of Chicago who told the committee that **Ohio was the first state in the country to do a state-wide pilot of data science**. He was shocked when I told him that the funding for this program could be significantly reduced. About a year from now, I believe the entire nation will be celebrating the success of the discrete math and data science pilots in Ohio, which represent efforts to make high school math more interesting and workforce relevant. And it will be around that time that the covid19 relief funding runs out for these programs.

Recommendations:

1. Continue funding the discrete math and data science pilots at their current levels

Presently, the budget for discrete math and data science add up to $1M per year (total). These funds mostly go to Educational Service Centers all over the state to support staff who work with dozens of teachers in the discrete math and data science pilots. The program that supports these two courses is called Strengthening Ohio's High School Math Pathways.

2. Amend HB33 to require that the computer science education council include a math educator

HB33 proposes a "computer science council" that would include 13 members. I would respectfully ask the Senate to put into writing that one of those 13 members, or a 14th member would be a mathematics educator. I think this would help to highlight the important role that mathematics educators have in helping to bring computer science skills to students across our state. This person would be tasked with updating the computer science council on efforts to integrate computer science into high school mathematics. I also think the computer science education council should play a role monitoring such efforts.

Thank you for the opportunity to provide feedback on Computer Science Education in our state. I would very much like to further discuss this with you, and/or your staff. Please do not hesitate to contact me if I can be of additional assistance. My cell is 614-557-9387.

Regards,

Chris Orban