[BASICS] MAKING CS A PRIORITY IN SCHOOLS AND DISTRICTS: ADVICE FROM SCHOOL LEADERS TO THE CS EDUCATION COMMUNITY

What can the CS education community do to support implementation and expansion of CS learning in schools at the local and the state level?

To begin to answer this question, we turned to school leaders who are currently working to provide computing education. We reached out to 25 school leaders in three districts whose schools were using the Exploring Computer Science (ECS) high school computer science materials and asked:

"What incentives (any incentives—not just financial) do you think schools would need to actually make computer science a priority?"

Although leader responses touched on several issues, there were two consistent themes. The first relates to messaging about the importance and benefits of CS education, and is explored in greater depth below. The second emphasizes the role of funding for new programs—as one leader said, *"Obviously first thing is money…You can't offer something if you don't have the staffing for it or the money for it no matter what it is."* As funding in education is an issue that is not unique to CS education, this guide focuses on the messaging theme, highlighting quotes from school leaders.

The leaders' suggestions about effective non-financial incentives for implementing computing education provide a window into the priorities and needs of those working directly in and with school systems. Their experience and expertise can serve as a reminder to CS education stakeholders about where to focus efforts in their work with education decision-makers at the local and state levels. This guide captures their advice.

Messaging about Computer Science: The importance of clearly and consistently articulating the benefits of computer science education.

Many school leaders said messaging about the benefits of CS education is a key driver for education leaders (of all levels) to commit to CS, and spoke about the merits of clear and powerful messages about the role of CS education for students today. The school leader advice for the CS education community falls in to the three key areas below.

[1] Identify the value of CS education for schools

While the last few years have seen a large increase in efforts to develop and expand CS learning opportunities in K-12 education, the field is still emerging, and thus information and resources are rapidly changing. This can create a challenge for local and state education leaders attempting to navigate the landscape and find the most important and relevant information to support their decision-making about when and how to incorporate CS learning into districts and schools alongside other programs. Successfully bringing CS in often means needing to clearly

articulate how CS learning aligns with existing educational initiatives and requirements, and what exactly the value is for schools and students.

As one school leader explained, *"…in our test-driven world, what would entice a lot of schools is to see how this relates to Common Core, how it relates to the type of learning that students are going to be tested on."* Another leader said that ultimately, *"it has to start with the principal and maybe the curriculum director seeing that there is a value to offering the course in the school. …if you want to attract bright and gifted students to high schools, then you offer courses like CS that they would be attracted to."*

[2] **Highlight the role of CS education in job preparation**

"…look at what the job market is looking at and what business and industry are looking at as far as skills students are going to need post-college. What are those going to be in 2022?"

Identifying the skills and abilities students will need for future jobs generates a powerful message to state and local education decision-makers about the necessity of CS in schools now. One leader at the school level articulated the need in this way: *"…it is critical that we provide students with development education so that they can be independent and marketable human capital. If we're not doing that, then we're not doing our jobs."* Another leader described how computing skills will enable students *"to be more likely to find employment in the jobs of the future. Certainly, you see all the statistics now about where things sit,"* adding that *"I think people are enticed easily, that way."*

Another strategy is to emphasize the economic opportunities that computing skills and abilities offer students. So, while it's important to stress *"what the job market is looking at and what business and industry are looking at as far as skills students are going to need post-college,"* it is also critical to *"highlight the success of the students and… you can even highlight the salaries of people who go into that field in comparison to others."* The bottom line about CS skills and student futures, according to one school leader, was this: *"If you want [students] to be ahead in this technological society, even if [they] don't go to work directly with computers, every single company requires some level of competency or understanding of CS. It's unavoidable."*

[3] **Focus on the importance of the skills gained through computer science learning**

The key to CS education expansion is to drive home the importance of educational opportunities to learn skills and develop abilities in computing, wherever those can be nurtured. *"[T]he focus shouldn't be on computer science as [much as] on the skills that are emphasized and developed through computer science… the collaboration, the team working, the problem solving, the inquiry... and then using the code as a way to solve those problems - is probably a better way to package it, because most principals hear 'computer science,' and they think to themselves, 'Now, I have to be like Steve Jobs, and I have to find twelve hundred Steve Jobs for my building,' but that's not really what it is."* One leader suggested that other education leaders and CS stakeholders can communicate the value of CS skills by *"[sharing] some projects that students currently in CS are doing—seeing those and seeing how impressive those can be can help people see that it isn't just a waste of time and they're actually learning quality skills."*

State and local leaders will also need guidance about "*…how to integrate CS into existing programs and existing school days where I'm already offering a full load of courses, how to fit it in, how to pay for it?"* For those with the flexibility to implement stand-alone CS courses, advise them about CS course progression and pathways "*that can provide [students] with options for careers."* As one school leader noted, "*you need to get a national narrative or a national imperative about what you want kids to be doing."*

ABOUT THE BASICS STUDY:

The Barriers and Supports to Implementing Computer Science (BASICS) study is a three-year exploratory research project funded by the National Science Foundation (#1339256) as part of the CS10K program – an ambitious effort to have 10,000 well-trained computer science (CS) teachers in 10,000 schools. The BASICS study seeks to contribute to this effort in part by informing policy, school, and stakeholder leaders about the supports and barriers to wide-scale introductory CS education in high schools and strategies for addressing them. Over the course of two years, researchers at Outlier Research & Evaluation at UChicago STEM Education | University of Chicago interviewed school leaders in three different school districts whose schools were using Exploring Computer Science (ECS) instructional materials. It is important to note that BASICS is not, in any way, an evaluation of ECS. Rather, the BASICS study focused on the ECS curriculum as an example because it is widely used to teach introductory high school computer science.

Outlier Research & Evaluation (July 2017). School Leaders' Advice for Making Computer Science a Priority in Schools. Chicago, IL; Outlier Research & Evaluation at UChicago STEM Education | University of Chicago. Retrieved from http://outlier.uchicago.edu/basics/findings/Advice-prioritizingCSinschools/

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