

SB 962 The Middle School Curriculum

Chairwoman Slossberg, Chairman Fleischman, and distinguished members of the Education Committee, my name is James Maroney, from Milford, and I am here to testify in support of SB 962, an Act Concerning the Middle School Curriculum.

As a the co-founder of the Milford Education Foundation, former member of Milford's Board of Education and someone who was lucky enough to attend my community's public schools and graduate from an Ivy League college, I understand how important it is to capture the imagination of our students at a young age.

First, I would like to thank the chairs for including the concept of requiring computer coding be taught to all middle school students. Many of you may be wondering, just exactly what is computer coding and why is it important? Coding are the instructions that tell a computer what to do, and in essence powers our digital world. It has been described as another language, and for our children and future generations proficiency in computer coding will be a workforce competency. Even if they are employed in a field such as finance, insurance, or digital media, a knowledge of coding and computer programming will be beneficial to them. It is predicted that computer coding related jobs will grow at a rate of 22% and the number of graduate to fill those positions is not expected to keep pace. We are already seeing a lack of computer coding talent harming our state economy. In talks with representatives of Yale University, I learned that when many of the companies that are founded by their students receive venture funding they are told they need to leave Connecticut. They are told they need to move to either Silicon Valley or Cambridge. As a Yale graduate, I must admit that I am personally offended that they are taking Yale companies and moving them to Harvard. They are not told to move because of the cost of doing business, rather, they are told to move because there is not enough entry level computer coding talent in Connecticut. In order to build this bench of talent for well paying jobs and offer better opportunities for our students, I encourage you to require exposure to computer coding for all of our students.

I fully understand this is a difficult budget year, and the committee must be cognizant of any mandates placed on municipalities. I would recommend that the committee explore requiring that all middle school students be exposed to something at a minimum akin to the hour of code. We could have Charter Oak State College create this online module for the students, which they could take at some point during the year in their advisory period, which all students are already required to have. It would not take away any instructional time or impose any additional financial burden on local school districts, yet as a state it would help to continue to move our education forward and make us an innovator in the United States. It should be noted that this is the first year that England has required computer coding as part of its national curriculum.

I have attached several articles that I feel would be of interest to the committee and helpful as you deliberate on this bill. I thank you for your time and would be happy to answer any questions.

TECH

Data analytics start-up Hadapt raises \$9.5 million; plans move from New Haven to Cambridge

Posted by Scott Kirsner

October 21, 2011 12:37 PM

By Scott Kirsner, Globe Columnist

Need to find a needle in a haystack — or a crucial piece of business information that could be sitting in any one of a hundred different far-flung databases? That's the challenge that the rapidly-growing "big data" sector tries to address.

A Connecticut start-up, Hadapt, plans to announce next week that it has raised \$9.5 million from Bessemer Venture Partners and Norwest Venture Partners to bring to market its own needle-finding software. The 15-person company, hatched from Yale's computer science department, is also moving its headquarters from New Haven to Cambridge, hoping to tap into the area's deeper talent pool.

Hadapt is creating proprietary software that is designed to augment the Apache Hadoop open source platform that many companies use to manage databases that run across many different servers; Hadoop was originally inspired by software developed at Google to handle its vast index of Web pages, which is spread across lots of computing clusters.

"We're applying the same Hadoop open source technology that eBay and Google and Twitter use to handle their data, in a way that can benefit the rest of the IT market," says chief executive Justin Borgman, an Acton native who put his MBA studies on pause to start Hadapt with Yale prof Daniel Abadi.

Borgman says Hadapt enables users to search both structured data (like the record of a stock trade, which might include fields for time, price, and ticker symbol) and unstructured data (the text of a Facebook status update, for instance.) It can tie into business intelligence tools sold by companies like MicroStrategy and Tableau. And it gives users a SQL interface for conducting their queries, already familiar to many businesspeople. Borgman also boasts that Hadapt's software can improve query speed by 10 to 15 times over standard Hadoop implementations.

"Being able to work with a mix of structured and unstructured data addresses a big pain point," Borgman says. "You might have a list of part numbers in a structured database, and comments about their performance in an unstructured form, and we would help you correlate part #354 with a heat problem, where someone has reported that it tends to break at high temperatures."

Hadapt was founded in July 2010, and raised an angel round of \$1 million in January. Borgman says Hadapt will shack up in Bessemer Venture Partners' Cambridge office while searching for space of its own.

"We're still in our product development and beta testing period," Borgman says, adding that they hope to start selling to customers before the end of the year. The company is looking to hire software developers and sales engineers.

Education

High school students are all about computers but get little instruction in computer science

By **Donna St. George** April 23, 2014

Their lives swirl in technology, but the nation's high school students spend little time studying the computer science that is the basis of it all. Few are taught to write lines of code, and few take classes that delve into the workings of the Internet or explain how to create an app.

In a world that went digital long ago, computer science is not a staple of U.S. education, and some schools do not even offer a course on the subject, including 10 of 27 high schools in Virginia's Fairfax County and six of 25 in Maryland's Montgomery County.

"It's shocking how little there is," said Rebecca Dovi, who has taught computer science for 17 years in Virginia schools and is an advocate for more courses statewide. Even when schools offer classes, she said, there are relatively few of them. "You might have one person teaching it in a school of 1,400 kids."

Though computer science can lead to high-paying technology jobs and boost skills for a variety of fields, many students get little exposure to the subject in class. Across the Washington region's school systems, fewer than one in 10 high school students took computer science this academic year, according to district data.

But, slowly, that might be starting to change. Spurred in part by national initiatives, some local districts are urging more students to take computer science courses and trying to address a glaring gender and racial disparity. By next school year, school leaders expect more computer science courses in Montgomery high schools, more enrollment in courses in Virginia's Loudoun County and more schools offering classes in the District.

And Charles County, Md., with 26,500 students, has committed to bring such learning into every grade starting in the fall, in partnership with the nonprofit [Code.org](https://code.org), which works to increase access to computer science in schools.

"We really believe the skills they will get from coding will help them in whatever career they choose," said Charles County Superintendent Kimberly Hill, who pointed out that such learning requires logic and "habits of the mind" that have broader uses.

Computer science is not just for math whizzes and budding techies, she said.

"Typically it's male. Typically it's white male," Hill said, adding that it begs the questions: "Where are all the girls? Where are all the African American and Hispanic kids?"

Under the county's new plan, she said, the thinking is, "You can learn how to code, like you can learn how to read and learn how to write."

Among the reasons many schools do not have computer science: It is not a priority core subject, and computer science teachers can be hard to find, with some drawn to higher-paying tech jobs. While an increasing number of states allow the courses to count as a math or science credit, they are usually not a requirement and are sometimes viewed by students as boring or intimidating.

Many parents mistake the computers they see in schools — and the seeming ease with which teenagers manage their devices — as a signs of computer science understanding.

“These skills are as fundamental as algebra,” said Marie desJardins, a computer science professor at the University of Maryland Baltimore County who is leading a project to train 100 computer science teachers in Maryland and the District over a three-year period.

During the next decade, about 70 percent of new jobs in science, technology, engineering and math fields will be for computing professionals, desJardins said.

“There is not a field right now that computer science doesn’t contribute to or support,” said Chris Stephenson, executive director of the Computer Science Teachers Association. Still, she said, “most kids don’t have a chance to get introduced to this content in high school, and the kids that are least likely to have these opportunities are in high-poverty, high-minority schools.”

Hoping to reach more students, especially girls and minorities, Montgomery’s school leaders also have signed on with Code.org. Ten county high schools are slated to offer more-engaging courses that go beyond programming, with inquiry-based learning and topics such as the Internet and human-computer interaction.

“As a school system and a nation, we’re stuck in a box where computer science is not what we teach kids; it’s just something that you learn maybe later,” said Pat Yongpradit, a former Montgomery teacher who is director of education at Code.org.

Code.org has brought widespread attention to the learning gap, first with a video early last year that went viral — [“What Most Schools Don’t Teach”](#) — and then in December with [a week-long “Hour of Code”](#) campaign that drew in millions of people worldwide. The organization has partnered with an increasing number of school systems nationally — 32 as of this month — providing professional development for teachers and new curricular materials.

In Rockville, David Silversmith needed no convincing. One recent morning at Thomas S.

Wootton High School, the 17-year-old senior was puzzling over a line of code for a computer-based game of Connect Four. Silversmith has no plans to become a computer scientist but decided the class was important.

“I think whatever profession you do nowadays,” the Maryland teen said, “it will definitely help.”

In D.C. public schools, new courses were offered this school year at six high schools and another four high schools will get computer science classes in the fall.

“The kids like these classes, they’re showing up for them, they’re engaged,” said Anthony Priest, a D.C. schools program manager. The District’s [H.D. Woodson High School](#) made computer science a requirement for all ninth-graders.

There are smaller efforts to expand computer science, too. In Fairfax County, teacher Dan Tra jazzed up a programming course with lots of app development, worked hard to market it, and got about 130 students to take the class at Falls Church High School this year. More than 40 percent of the students were female.

Falls Church now has a Robotics Club and a Girls in Technology Club. More than 20 students entered a hack-athon in late March, some winning honors.

“In our school, there’s a thirst for it,” Tra said.

Computer science courses are poorly tracked nationally and often misunderstood, experts say. Many people confuse courses about using computer software with true computer science, which is about creating and problem-solving with computers.

The most reliable figures about computer science’s reach into high schools come from the Advanced Placement (AP) exam. In Fairfax County, which has nearly 52,000 high school students, 740 students took the most recent AP exam in computer science. In

Montgomery, with more than 45,000 high school students, 521 took the most recent AP exam. There were a little more than 600 exam-takers combined for public school systems in the District, Prince George's County in Maryland, and Alexandria and Arlington, Loudoun and Prince William counties in Virginia.

Barbara Ericson, a senior research scientist at Georgia Tech who studies AP computer science results, said Maryland, Virginia and the District made [the top-10 list](#) for computer science participation per capita in 2013. Nationally, 29,555 students took the exam.

Still, Ericson said, it remains a course of the few: More than 270,000 students took the most popular AP calculus exam last year, and nearly 200,000 took biology exams. In 2013, girls accounted for 18.6 percent of computer science exam-takers, Hispanic students 8.1 percent and black students 3.7 percent.

Locally, there are signs of both the problem and new interest.

T.C. Williams High School in Alexandria, for example, lost its computer science teacher and was unable to find another who was certified, so the seven students now in the course take it online, officials said.

In Loudoun, enrollment is on the rise and a [Microsoft program called Technology Education and Literacy in Schools, or TEALS](#), has brought professionals into classrooms. All 13 Loudoun high schools offer computer science and AP computer science.

Dan Kasun, a Microsoft executive involved in the program, said the collaboration inspires teachers, who in turn get their students excited. About 1,075 students are expected to take classes next year in Loudoun, up from 845 this year.

“People are realizing these are the skill sets that are going to lead to 21st-century jobs,” Kasun said.

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Donna St. George writes about education, with an emphasis on Montgomery County schools.

Technology

Coding in the Classroom: What is Coding and Why is it so Important?

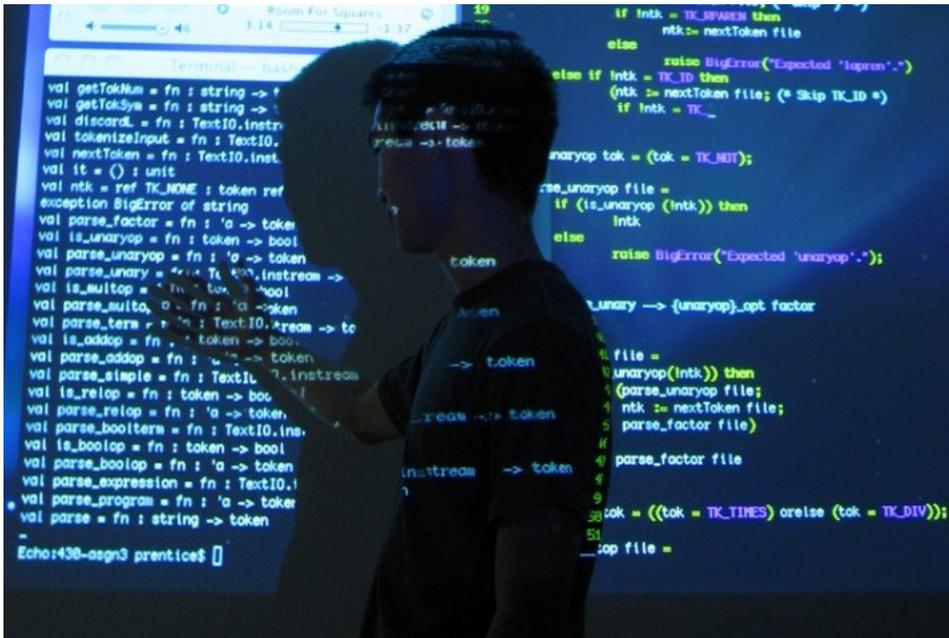


By **Anthony Cuthbertson**

August 29, 2014 13:58 BST

80

26



Coding is to be introduced into the national curriculum, but two thirds of parents know nothing about it. Nat Welch/ CC

One of the biggest overhauls of the national curriculum in 14 years is to come into affect from Monday, 1 September as information and communications technology (ICT) is replaced by a new computer science programme.

As part of the new computing curriculum, coding will be taught in primary and secondary schools across England to children between the ages of five and 15, however, it seems like someone has forgotten to tell the parents.

A new study from Ocado Technology has revealed that two thirds of parents with primary school children are oblivious to the new computing curriculum.

As part of a week-long series of features about *Coding in the Classroom*, **IBTimes UK** takes a closer look at coding in order to help anyone unfamiliar with the subject to get with the programme, so to speak.

What is coding?

Coding, in the simplest of terms, is telling a computer what you want it to do, which involves typing in step-by-step commands for the computer to follow.

Computers are not clever things, however they are very obedient. They will do exactly what you want them to do, so long as you tell them how to do it correctly.

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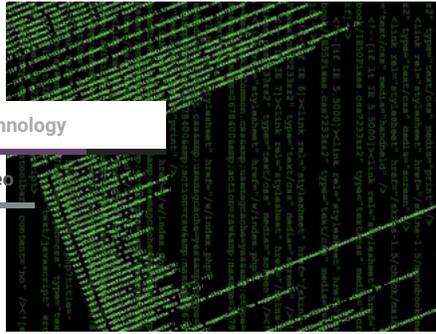
Columnists



Edmund Shing

“SuperGroup and easyJet promise new momentum in the stealth bull market”

Learning to code has been likened to learning a foreign language, or perhaps more specifically a family of foreign languages.



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one designed with certain things in mind. Examples include C, a 'low level' but fast

programming language that is good for anything graphically intensive like games; Javascript, which was specifically designed for dealing with web content; and Perl, a multi-functional language that is often referred to as the 'swiss army knife' of programming.

Why is coding important?

Code powers our digital world. Every website, smartphone app, computer programme, calculator and even microwave relies on code in order to operate. This makes coders the architects and builders of the digital age.

Over the next 10 years it is estimated that there will be 1.4 million jobs in computer sciences and only around 400,000 graduates qualified to do them.

Jobs not directly linked to computer sciences - such as banking, medicine and journalism - will also be affected by the need for at least an understanding of programming and coding.

Linda Liukas, co-founder of coding workshop programme **Rail Girls**, believes that coding is "the literacy of the 12st century" and the need for people to speak the ABC of programming is imminent.

"Our world is increasingly run by software and we need more diversity in the people who are building it. More importantly, writing software is about expression, creativity - and practical application," Liukas told **IBTimes UK**.

"Our kids should learn to bend, join, break and combine code in a way it wasn't designed to. It's a whole generation of kids that will use code like our generation used words."

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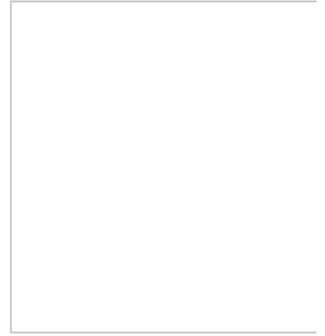
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hari krishnan

Aug 30, 2014

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software plays a vital role to run a hardware. so the future will be in the hands of computer programmers. so coding has been included in elementary education to get a strong foundation knowlege.

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Chris Dasinsky

Aug 29, 2014

It's true, our world is increasingly going digital. This is not only true for the world, but in businesses as well. Because of this, having coding skills appears to have more and more importance in many careers from one year to another. I suggest that anyone interested in ... more

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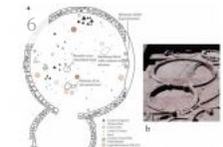
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Job Outlook

About this section

Employment of software developers is projected to grow 22 percent from 2012 to 2022, much faster than the average for all occupations. Employment of applications developers is projected to grow 23 percent, and employment of systems developers is projected to grow 20 percent.

The main reason for the rapid growth is a large increase in the demand for computer software. Mobile technology requires new applications. The healthcare industry is greatly increasing its use of computer systems and applications. Also, concerns over threats to computer security could result in more investment in security software to protect computer networks and electronic infrastructure.

Systems developers are likely to see new opportunities because of an increase in the number of products that use software. For example, computer systems are built into consumer electronics, such as cell phones, and into other products that are becoming computerized, such as appliances. In addition, an increase in software offered over the Internet should lower costs and allow more customization for businesses, also increasing demand for software developers.

Some outsourcing to foreign countries with lower wages may occur. However, because software developers should be close to their customers, the offshoring of this occupation is expected to be limited.

Job Prospects

Job prospects will be best for applicants with knowledge of the most up-to-date programming tools and languages.

Employment projections data for software developers, 2012-22

Occupational Title	SOC Code	Employment, 2012	Projected Employment, 2022	Change, 2012-22		Employment by Industry
				Percent	Numeric	
Software developers	—	1,018,000	1,240,600	22	222,600	—
Software developers, applications	15-1132	613,000	752,900	23	139,900	[XLS]
Software developers, systems software	15-1133	405,000	487,800	20	82,800	[XLS]

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

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