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Why Puerto Rican Students Need to Take Computer Science Education into Their Own Hands [1]

Enviado por Kiara Sofia Vega-Bellido [2] el 26 abril 2016 - 10:41am

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Photograph taken from abc.net's "Behind the News": http://www.abc.net.au/btn/story/s4301073.htm

"Whether you want to uncover the secrets of the Universe or pursue a career in the 21st century, basic computer programming is an essential skill to learn." Stephen Hawking, theoretical physicist, cosmologist, author, and programming enthusiast.

Back in 1984, prompted by AT&T's unlikely investment in the computer [3], humankind entered an Age characterized by the ubiquity of technology and information. Consequent technological advances have cultivated new ways through which we can understand the world and manipulate it. Moreover, the evolution of our means of communication has revolutionized the way we live our lives and perhaps even the way we think [4]. Since the invention of the personal computer, programming has become one of the most effective methods for harnessing the power of our most widespread and commonly used technology. Increasingly so, people are taking an interest in learning how to manipulate what is arguably our generation's most powerful tool. I'm talking, of course, about programmers.



Being able to program software is just one of the reasons why you should seriously consider developing your coding skills, however. Computer programming's inconceivable range for utility has partially provided the motivation behind many of the initiatives popping up in the US to promote the integration of computer science into the curriculum of primary, secondary and post-secondary school [5], most notably President Obama's "Computer Science for All" initiative [6]. "CS for all" aims to prepare today's youth for the technology-driven world they are to live and work in as the active citizens and professionals of tomorrow.

Another important part of the reasoning behind enterprises like "CS for all" is based on computer science's capacity as a pedagogical tool [7]. To program, it is not just important to learn the language, but also to learn to think algorithmically and creatively in order to weave the logic of a process into the code you're writing and get the computer to complete a specific task. Coding trains you to solve problems, to break them down into smaller pieces in order to understand and solve each required step until the program runs seamlessly. Implementing computer science education in the classroom (or outside of it) can facilitate the teaching of STEM courses through fun and interesting coding problems. Such problems would require the student to exercise his/her understanding of the logic underlying mathematical and scientific concepts, in ways similar to the ones already developed and employed by programs like Bootstrap [8] and Code [9].

And besides teaching kids how to calculate factorials through coding exercises, computer science education has the potential to serve as an equalizer or inclusion device for minorities [10]; fomenting minorities' interest in CS early on will help prepare and encourage them to enter into a rapidly-growing and influential job market [11]. Knowing how to code is a considerable advantage in any professional or academic setting. Given its interdisciplinary usefulness, there is currently a high demand for not only digital literacy, but also quality programming experience and skills in the job market and in many academic fields [12] (ranging from neuroscience to security).

Taking into consideration the overwhelming evidence promoting Computer Science education in any modern, techno-centric society, it begged me to question: Why haven't similar initiatives become part of Puerto Rico's educational reform? The obvious answer is that any type of reform in the Island is currently under the obligation of serving the payment of our outstanding debt [13]. This means that the only changes the economy allows to be made to the educational system probably involve cuts [14] and privatization [15] rather than restructuring the standard curriculum. And unless something extraordinary akin to Estonia's technological revolution (ever heard of Skype?) [16] happens and popularizes programming as a fun, cool, and powerful method of influencing society and boosting the economy, your options for learning computer programming in the Island are basically limited to self-teaching until college. This requires not only a very strong interest in teaching yourself to code as a hobby, but also having the resources to pursue this interest.

Thanks to the internet (and how amusing coding is), this is not so difficult. Which is why Puerto Rican students should become aware of how useful and empowering, for themselves and for the country, learning how to program can be. It is urgent that more Puerto Ricans take an interest in this almost magical skill. The bigger and the more visible the Puerto Rican programming community gets, the better our chance of conducting social and technological reform while raising awareness for the necessity of integrating Computer Science education into our schools. There are myriads of sites and books dedicated to teaching different programming languages as well as whole courses on programming that you can take online [17] (these are not the only ones; search for yourself). If you want to learn how to program in Puerto Rico (and by now, I hope to have convinced you to do so) there's really no excuse not to.

PS: If you are interested, there are several ways you can become part of the community/movement on the Island. Check these out: HackPR [18], AMCC [19], ACM [20], Idea Platform [21], H3 [22], Programadores Puerto Rico [23], #Include<Girls>… [24]

Editorial piece written by a member of the UPRM Science Communication Initiative in collaboration with the *"Academia para Investigación para Facultad y Postdoctorales"* with the aim of promoting "open source" Computer Science education in the academic community and youth of Puerto Rico while publicizing established efforts to do so on the Island.

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