Hacking the Future:

Access to Coding Education Can Help Rhode Island Youth Escape Poverty

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The invention of the modern computer was a massive development in human history that many people take for granted. Today, computers allow for near-instantaneous communication, new tools for education, and the quick spread of information on important issues in the world. Advancements in computers and their greater availability are also allowing young people to obtain greater economic opportunities, assuming, that is, that they have access to computers and instruction on how to use them.

The United States has, on average, lower possible economic mobility than other similarly advanced countries, so kids born into lower income families tend to have difficulty escaping from poverty. 65% of Americans raised in the bottom fifth of incomes stay in the bottom two fifths (New York Times). The problem is especially bad in Rhode Island which has the highest poverty rate in New England at 12.8 percent (Providence Journal 2017). Providing greater access to computer education would give opportunities to young people to learn skills that they could apply in a job. Learning coding – the process of writing code for the computer to interpret that allows people to create a variety of things, including apps, websites, tools, and more – can help young people get better career choices. Half of the top 25% of income-earning jobs (those with salaries greater than $57,000 per year) require coding skills and programming jobs in particular are growing 50% faster than the job market overall. However, coding skills aren't only useful for becoming a programmer; they can also be useful for designers, engineers, scientists, and others. On top of this, jobs that require some form of coding skills pay on average $22,000 more than

those that don't (BurningGlass). In this way, learning coding can provide those suffering due to poverty a way to escape from it.

Fortunately for Rhode Islanders, Rhode Island and Maryland have the highest adoption rate of advanced Computer Science classes in the country: upwards of 40% in high schools that offer AP courses (Recode). This higher adoption rate is due in part to the work of CS4RI, an initiative created by Governor Gina Raimondo, that advocates for making computer science part of the curriculum for every Rhode Island student (CS4RI). Additionally, in Providence, some programs have been established for high school students to learn coding outside of school. One such program is run over the summer by IntraCity Geeks. The program teaches 40 high school students how to code and pays them while doing so (Providence Journal 2018). Although programs like this can help lower income kids learn coding, most other programs cost money and don't pay wages, limiting the number of people they can actually help. These issues mean that the kids who need these programs the most might not be able to afford them or might feel pressure to get a job in order to help out their family instead.

The computer science programs offered at schools also could be improved, namely the fact that there are few middle ground or continuous courses. The two programs being focused on in Rhode Island public schools are a program called Hour of Code, which teaches K-12 students the basic ideas behind building programs in about an hour, and AP Computer Science, which is a full-on Advanced Placement course. The problem is that Hour of Code is usually just enough to get students interested in coding and AP Computer Science, when available, only lasts one year of high school and may seem too challenging to take. To create something of a middle ground, some schools and libraries have created informal coding clubs or taken advantage of resources through local colleges. For example, at my school, students from Brown University come once a

week after school to teach coding to interested students or help students that know more create larger projects.

As computers have advanced, coding has become easier to use and learn. A simple search on Google for "how to code" yields more than six billion results. Developments in coding languages themselves have also made coding easier to learn. For example, Python, which has grown incredibly in popularity over the past five years, is becoming one of the de-facto languages for learning coding due to its simpler code structure and English-like keywords (StackOverflow). Python is not just for beginners, however, as many professional machine learning tools are implemented in Python. Shared pieces of code, called libraries, also make learning coding easier as they allow beginners to focus on their project rather than trying to reinvent the wheel to solve common problems. These developments make it easier for beginners looking for a foot in the door with coding.

Website design has also come a long way, even in the past ten years, with new features being added to browsers all the time. Web design used to involve juggling all kinds of coding quirks in order to simply create a website that would function in most browsers. This made it unlikely for beginners to be able to navigate the various tricks required to create a functional website. But now, through the adoption of standards, many of these differences have been ironed out and tools have been developed to deal with those that remain. As a result, learning how to build a website is much easier, both to teach and to learn. Learning web design is a particularly useful skill for young people because they can use it to help them apply to any job, not just ones that involve coding. According to Forbes, 56% of all hiring managers are more impressed by an applicant's personal website than any other personal branding tool, but only 7% of job applicants actually have one. So by having a personal website, whether entirely created by the applicant, or

modified to suit their needs, puts them in a better position than the vast majority of job applicants. While these developments mean that students can learn a lot on their own, they could learn faster and better with help from more consistently available courses and programs.

According to Stephen Hawking, "Whether you want to uncover the secrets of the universe, or you just want to pursue a career in the 21st century, basic computer programming is an essential skill to learn" (Code.org). In a time where so much of our world is controlled by technology, learning its language will prove to be an invaluable skill, helping Rhode Island youth improve their economic situations. A key part of this is ensuring that these opportunities can be enjoyed by all, by providing access to the technology and the educational opportunities required.

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