

False Assumptions Made in Cybersecurity Curriculum: K-12

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Abstract : With technology and STEM fields growing every day, there is a significant projected shortfall in qualified cybersecurity workers. As such, it is essential to develop a cybersecurity curriculum that builds skills and cultivates interest in cybersecurity early on. With new jobs being created every day and an already significant gap in the job market, it is vital that educators are pro-active in introducing a cybersecurity curriculum where students are able to learn new skills and engage in an age-appropriate cyber curriculum. Within this growing world of cybersecurity, students should engage in age-appropriate technology and cybersecurity curriculum, starting with elementary school (k-5), extending through high school, and ultimately into college. Such practice will provide students with the confidence, skills, and, ultimately, the opportunity to work in the burgeoning information security field. This paper examines educational methods, pedagogical practices, current cybersecurity curricula, and other educational resources and conducts analysis for false assumptions and developmental appropriateness. It also examines and identifies common mistakes with current cyber curriculum and lessons and discuss strategies for improvement. Throughout the lessons that were reviewed, many common mistakes continued to pop up. These mistakes included age appropriateness, technology resources that were available, and consistency of student's skill levels. Many of these lessons were written for the wrong grade levels. The ones written for the elementary level all had activities that assumed that every student in the class could read at grade level and also had background knowledge of the cyber activity at hand, which is not always the case. Another major mistake was that these lessons assumed that all schools had any kind of technology resource available to them. Some schools are 1:1, and others are only allotted three computers in their classroom where the students have to share. While coming up with a cyber-curriculum, it has to be kept in mind that not all schools are the same, not every classroom is the same. There are many students who are not reading at their grade level or have not had exposure to the digital world. We need to start slow and ease children into the cyber world. Once they have a better understanding, it will be easier to move forward with these lessons and get the students engaged. With a better understanding of common mistakes that are being made, a more robust curriculum and lessons can be created that not only spark a student's interest in this much-needed career field but encourage learning while keeping our students safe from cyber-attacks.

Keywords : assumptions, cybersecurity, k-12, teacher

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