Improving the Pipeline: Lessons Learned

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ABSTRACT

Improving the Pipeline [1] is an NSF funded grant to extend the cybersecurity pipeline into the high school environment. High school students explore cybersecurity concepts while earning credit for an introductory cybersecurity course. This paper discusses several lessons learned after the first year of the program.

CCS CONCEPTS

• **Social and professional topics** → **Computing education programs; K-12 education;** • **Security and privacy;**

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1 CURRENT PROJECT STATUS

The course content was developed as standalone modules in the following topics: basics of computing and security, security by design, network and wireless security, encryption and hashing, protecting availability, social engineering, risk, policy, and legal issues [2].

The first cohort of students completed the program during the 2017-2018 academic year. The program started with 19 students, of which 16 successfully completed, drawn from two local school districts. Students were separated into two sections to offer an afternoon session one day and an evening session on another, allowing students to participate in high school activities. Each class had students from both participating schools. Participants completed pre and post assessments for each module as well as the entire program. Although there was no incoming expectation, students completed a math placement exam prior to beginning the program. Math placement exam results will be compared to student performance to select the appropriate math prerequisite when the course is offered for all students.

Faculty have visited four high schools to recruit students for the 2018-2019 academic year. It is anticipated that the program will run during the next academic year with 30 to 40 students.

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2 LESSONS LEARNED

This section provides a collection of observations associated with offering an on-campus college class exclusively to high school students.

School district cancellations. During the winter, one of the two school districts canceled classes several times. It was decided that if either district canceled classes or campus was closed, the grant class would be canceled as well. This resulted in the two sessions covering the same material at a different pace. An effort was made to keep the content aligned to prevent exams from falling in two different weeks. This created confusion among the students.

Student absences. Early in the year, students who could not make one of the sessions were encouraged to attend the session on the other day. While the sessions were aligned, this worked well. Once school cancellations became common, it became problematic.

High school student activities. Although the students did not anticipate conflicts at the beginning of the year, as the year progressed conflicts affected student attendance more regularly. Two students dropped the course due to greater interest in their respective high school activities.

Ethical issues. After accepting the cohort, one school notified the college of a student with varying legal and disciplinary issues surrounding cybercrime. The student was removed from the cohort.

3 POSSIBLE RESOLUTIONS

During the next iteration, class sessions will be recorded. Students who miss classes will be encouraged to view the recorded lesson. In this way, the student will have the opportunity to view the lesson and more easily complete associated activities. To minimize ethical issues, school districts will vet the selected participant lists for student conduct related issues prior to notification of selection.

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