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# Using Minecraft Education Edition to Teach Cybersecurity Self-Defense

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# Using Minecraft Education Edition to Teach Cybersecurity Self-Defense

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**Poster Session**

## Abstract

This project generates a creative implementation of Minecraft to enhance cyber security self-defense skills in K5-8 students. The intention is to enhance DSU's position as a leader in K12 cybersecurity education by creating a engaging platform for instructing 5th through 8th grade students about online pitfalls. A key first step in that process is creating a viable Minecraft challenge experience, a "World" that will both engage and instruct.

## Background

Cyber Security has been a growing concern for the computer industry over the past couple decades, and teaching this topic to the next generation has become a necessity. Mediums that can aid in teaching this topic better than a lecture or textbook will greatly help the process of student learning in the classroom. Oftentimes, interactive simulations such as Minecraft have shown themselves as prominent learning tools in both traditional schools and private learning companies, such as Learn, Build Create, founded by DSU students.

## Literature Review

James Gee, a prominent writer on the topic of video games in the classroom, has brought to light the traits games share with classroom learning. Namely, games showcase learning principles found within traditional learning, allowing transition of learning objectives to flow easily into the game realm. Furthermore, Gee states that the ability to co-design solutions in games to well ordered problems gives them an edge over independent work. The coop aspect of video games helps build a team mentality as well as reinforce the learning aspects, allowing students to be prepared for working in groups. Using Minecraft as a medium, teaching complex topics such as cyber security becomes more interactive and engaging for the student, and the group play ability of Minecraft allows multiple people to work together.

## Methodology

A Minecraft Education Edition has shown great promise for the utilization of a learning environment as well as an adventurous storyline. In our game, player navigates the ancient ruins of a city, answering questions of various Non Player Characters (NPCs) to progress through the story. In our version, questions revolve around a Cyber Security focus to educate students on online safety.

## Results and Discussion

In companies that already use Minecraft to teach basic programming skills, students already often show a great amount of enthusiasm and zeal for not only learning the lesson but participating in the side projects and 'homework' that follow. The multiplayer feature of games like Minecraft also allows the students to finish works with one another, further reinforcing the lesson as they work together on how to best complete the project. Oftentimes the one drawback seen can be the lack of enough instructions on the project specifics, which is easily remedied by either a more intense point system or better explanation of said project or the controls. Beta testing of the game with target audience students was not funded.

## Conclusions

Video games show a high affinity for being able to enhance education and replace based lecture teaching. The ability to produce a three dimensional environment allows for greater engagement in the cybersecurity curriculum at a younger age level than one might normally expect, and the ability for a multiplayer system gives students the opportunity to work within said environment. Additionally, the numerical scores and ability to limit materials for a project allows teachers to better control what they want students to use in projects. This, coupled with an ability to teach any aspect of a cybersecurity curriculum give games a lead in the future of teaching.