

Collaboration and Connection through Video Games

-- An Investigation of Minecraft

Zhaoxi Zhu

Graduate School of Education, University of Pennsylvania, Philadelphia, PA 19104, USA

Abstract: To make the wireless sensor network used for intelligent workshop products tracking system, firstly, the moving target tracking technology of wireless sensor networks was introduced and the target positioning technique based on ranging was emphatically analyzed, which laid the technical foundation for the construction of moving target tracking system of wireless sensor network. Then, the extended Kalman filter algorithm with less calculation and high tracking accuracy and implementation steps of untraced Kalman algorithm were analyzed and summarized.

Keywords: Collaboration and Connection; Minecraft; Digital Learning.

1. Introduction

Minecraft is a game that goes viral across the globe. According to new research, it is the best-selling video game of all time and the most viewed video game on YouTube in 2019. One hundred twenty-six million people play every month [5]. With the help of the demographic of Minecraft, it is surprising to find that over 63% of players are under 21 years old. We cannot overlook the fact that children and young teenagers (under 15 years old) consist of more than 20% [1]. Based on the existing trend of young children's enthusiasm for Minecraft, educators are gradually beginning to explore its educational value of it. Minecraft provides a platform for developing hard skills such as reading, writing, science, and math. In addition, it also provides education for soft skills such as cooperation, problem-solving, and interpersonal communication skills.

Minecraft is a first-person 3D open-ended sandbox game. There are no unified or required goals in this game, and players can explore this game at their way and own pace. Overall, Minecraft, to a large extent, enables a free world where there are almost no limitations. This provides a fertile space for everyone to learn through creating and constructing. Since educators and practitioners have started to realize the educational value and potential of this game, more people are trying to dig out the educational aspects of Minecraft. The game company even published an education edition for use in classrooms. But in this study, we are going to focus on the original version of the game.

This investigation was done to explore how participatory culture makes its presence in this game. It also looked at how this platform promotes or inhibits students' cooperation environment. Based on these defined elements, to consider in the use of videogames in collaboration cultivation, it further examined the feasibility of Minecraft as an out-of-school digital literacy tool for collaboration purposes.

2. Literature Review

2.1. Participatory Culture

Teens who are creating media content and using the internet to share the content they produce are considered to be engaged in participatory cultures. The participatory culture

does not require a high standard of artistic expression and civic engagement [4]. Jenkins and his co-authors wrote, "Forms of participatory culture include affiliations, expressions, collaborative problem solving, circulations. (pp. xi-xii)" They further explained how new literacies, such as play, appropriation, collective intelligence, and networking, are critical literacy skills. These skills are developed based on collaboration and networking [4].

A study by Hopelab and Well Being Trust found that 93% of youth aged range from 14 to 22 use social media, and a majority of them use it daily. The use of the internet includes but is not limited to writing blogs, creating webs, or sharing original content [7]. There is no apparent distinction between different races or ethnicities in participating in these online activities [4].

Young people can acquire social skills and competencies which will help them become more successful in the future, and it seems there is equal access to these resources. However, this does not mean we should let adolescents experience and learn in these online environments alone. Jenkins et al. [4] point out three concerns that need pedagogical interventions: the participation gap, the transparency problem, and the ethics challenge.

Video games are places where participatory cultures take effect. It is controversial to apply video games to the cultivation of social skills and cultural competencies. Nonetheless, we could not overlook the power of video games and neglect how children are intrigued by games. Therefore, in order to prepare young children with the necessary social skills to be active participants in society, everyone who is engaged in the process of cultivating has worthy contributions [4].

2.2. Platform

Video games are platforms and are operated on different consoles (website, Nintendo Switch, PlayStation 5). Investigating a game does not mean pivoting on the game itself. We need to focus on the game's correlation with other games, the operating platforms, and the more comprehensive system [6]. Examining a game requires us to understand "how a game is communicated and interacted with shapes and limits one's experiences, literacy production, and spatial exploration (Garcia 203)."

Nichols and LeBlanc [6] have identified what frameworks

for studying platform relations educators should use. These include social, technical, and economic perspectives. These three perspectives are overlapping and entangling. The technical aspect largely influences the social aspect. The economic perspective is the most common one that is left out by educators when using the platform. When digital platforms are integrated into teaching and curriculum, it is necessary to reflect on how platforms influence the learning environment. According to researchers, social, technical, and economic aspects can be both beneficial and harmful to educators' pedagogy.

Besides studying the system of a game that is situated in, and the three perspectives mentioned above, Garcia [2] also stated the importance of studying player affinity groups. The player communities are related to "connected learning" and "contemporary situated learning communities" (Garcia 204).

The reason why we need to study the video games that have or will have been utilized in an educational setting is clear. The game platforms offer opportunities for educators to incorporate more ways into digital literacy cultivation. Educators and students not only use platforms but also critically reflect on them. For example, teachers use Scratch to show how software consists of code [6].

3. Experiencing Minecraft

Given the real-world situation, Minecraft is recognized as a game for all ages since there are many very young players [1]. However, according to Entertainment Software Rating Board, Minecraft is suitable for players over ten years old due to "fantasy violence" and "fighting" [8]. Besides age factor, gender, race, career, etc., do not distinguish the users of this game. Therefore, the ideal users of Minecraft are people who are older than 10.

People who first play this game follow a single pattern: craft better tools and slash the dragon. As more and more players joined the game, the use of Minecraft became various. Players can raise a farm, build the Empire tower, or just wander in the game world. Till now, we even can use it as an education platform. Since Minecraft is free enough, there is almost no limit on ideal use.

As the game has changed a lot since I first played it, I chose to re-experience it as a new player. This means a new entry to the game, which encompass a new account, a new map, and a new beginning-to-end experience. Since collaboration is also a subject we study, I invited four sixth graders (three boys and one girl) who have no or little knowledge of Minecraft to join the study. The tasks that are given to the four students are divided into two parts. First, they are allowed forty minutes to explore the game on their own, which means there are no restrictions for them, and they can do whatever they want. They can choose to experience survival or creative mode. Second, the four students are given a total of 14 hours (2 hours each day) to achieve a shared goal. The goal is to get as much iron as possible. They will be online at the same time for the required two hours. During this cooperation process, we eliminate the competence between the four players, and they will share all the resources. When the four students are playing it, I will be in the same world but on an observing mode.

3.1. Beginning Phase

After installing the software and creating an account for online playing, this page shows up (see Figure 1). It is straightforward with only five buttons. On this page, a player

can choose to play alone or with others. On the background of this screen, a player can identify trees (probably willows), lotus leaves, a lake (which can be considered as waters), and a chest on a boat. These elements enable a player to guess what the game world will look like.

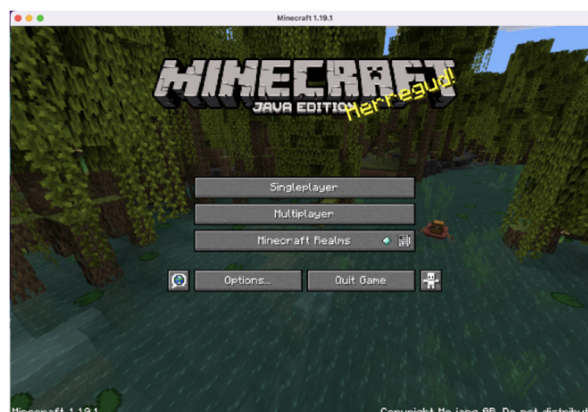


Figure 1. Initial game interface

After a player starts the game, a player is placed on an entirely randomly generated map (see Figure 2), which is almost impossible to repeat. A player may need a few minutes to figure out what this world is and what the surrounding is. It is easy for a player to notice the instructions that are displayed in the top right corner. These instructions are about how to control the character and some basic moves. There are more instructions in the next few minutes as a player tries to move around and explore the world.

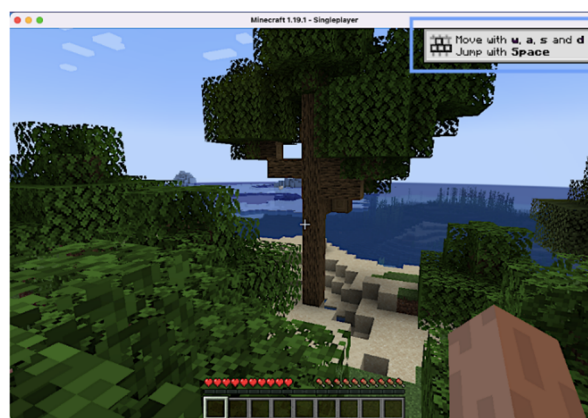


Figure 2. An entirely randomly generated map

From the first impression of this game, the most outstanding feature of this game seems to be the world that is constructed of blocks of the same size. The blocks can represent the living or dead, the solid or fluid. A player also finds himself in a natural setting, where trees, grass, and dirt make a large presence. If a player has not been exposed to the game before, they will be slightly confused about what to do next at the end of a simple guide.

Students' reflection: Three students tried out the creative mode, and one confronted the survival mode. In creative mode, they felt there were so many things to explore. Each of them did something different. One of them tried to build a very tall tower because he wanted to figure out how high can he be in this game. Another one tried to build a nice home for herself. She used a lot of materials from the menu and wanted to make her house more colorful. The last student in this mode created a bunch of creatures and watched them fight against each other, then flew across the vast world. On the other hand,

the boy in the survival mode felt obscure and wandered aimlessly in the world. As he had never touched on this game, he had no knowledge of what he was supposed to do.

3.2. Middle Phase

The platform definitely encourages players to enjoy themselves together. Most tasks in the game are large and will be better if multiple players collaborate. In Minecraft multiplayer, people can join the game with friends or strange players from the internet. Two main ways for players to communicate are through text and voice. Voice contact does guarantee that communication is efficient and accurate, which lays a great foundation for collaboration. There are also different identities for players to participate. Players can choose to be an observer, a manager, an operator, or a player. An observer means the player cannot modify the map, while the other three identities have different levels of authority to change the world. What makes Minecraft stand out among other games is there are no rules and no end. No rules lead to endless scope for creativity. The various ways of playing the game motivate players to break down the game pattern that players are used to. The no-end design secures players' continual interest in this game.

Gee [3] argued that players and designers should all be producers and "insiders" of a good video game. In a good game, players can proactively personalize the learning. This concept overturns the traditional classroom model where the teacher is the "insider", and the student is the "outsider", and the student must accept what the teacher teaches.

On account of the popularity of Minecraft, several Minecraft online communities emerged, such as Minecraft Wiki, Minecraftopia, and Minecraft Museum. The purpose of these communities is to provide a platform where players can exchange knowledge of the game. In most of these communities, every player can edit the content and pass the knowledge to novices. These platforms' purpose aligns with the definition of participatory culture that "some type of informal mentorship whereby what is known by the most experienced is passed along to novices" [4].

Minecraft is available almost on all digital devices, but there is a slight difference in the editions that can be played on different devices. Overall, computers, handheld computers, and controllers of game consoles that have microphones will promote players' communication and collaboration since immediate information exchange is important in this game.

Students' reflection: When they began the second part of the task, they had no clue where to find the iron. However, they still tried to explore the unknown world and built a home for the four. Then the girl proposed they could search online for information, and she took over the responsibility. Other boys continued to collect resources and crafting tools. When the girl brought the instructions back, they started to take on different roles. The girl and one boy stayed at home and kept collecting resources for the things needed in exploration. The other two boys went on the journey to mountains that have rich iron resources. After they finally found one place, the girl started to transport the iron they collected back home and sent new tools and food for the miners. At last, in these 14 hours, they successfully collected 86 irons. During the entire collaboration process, they became better in tone with each other. Also, their communication has never stopped. We can see that collaboration and connection between each other are deepened. The four students all reflected that they felt they knew more ways about problem-solving, which included

turning to the internet and trying various logical methods.

3.3. Temporary Ending Phase

It is clear that this game has no end, so I changed the title to a temporary end. Through the experience and observation of the four students, a lot of educational affordances are seen. When students want to craft tools, they need math to calculate the number of resources they need and how many tools they can craft. When they use the furnace, they understand basic physics. When they encounter difficulties, they need to solve them by "playing" or "networking" (Jenkins et al., 36-91). When they engage in the online community, they learn to interact with various people. From solid knowledge to soft skills, these are all valuable skills they need to master in order to become proactive participants in society.

Jenkins et al [4]. state that schools, the formal learning environment, react slowly to the participatory culture. Therefore, out-of-school settings should grasp the opportunity to make the change. I found this digital space can be integrated into any extracurricular curriculum where teachers are present. In out-of-school settings, no matter knowledge or new media literacy skills can be taught, and parents will be less skeptical when video games are utilized in such settings. It is also possible for parents to engage in the game with their children and encourage their kids to learn during the play.

Students' reflection: Since they were given little or no instructions, they mostly tackled the problems on their own. Four students told me that they felt more confident than before when working on their own.

4. Limitation & Conclusion

One of the biggest limitations of this study is the insufficient number of sixth graders in the tasks. Due to the short time, I was not able to recruit more participants. More participants could have been better for this research and produced more accurate results. Having more groups do the same task makes it possible to identify the differences between the collaboration process and draw a conclusion on how good results are associated with the quality of collaboration. Another limitation is that the choice of participants is not random. The four participants have a good connection in real life. Thus, they may demonstrate better collaboration than four randomly selected participants.

In a connected world, digital platforms are becoming learning infrastructure [6]. The skill of collaboration can be acquired and trained in Minecraft, whereas the bonded online community allows students to be a part of an affinity group where only shared endeavor matters [3]. Minecraft is a well-designed platform that enables students to learn. "Video games incorporate a powerful learning principle that fits well with inquiry-based classrooms", Gee [3] wrote. Its game features provide infinite possibilities for educators to utilize in different settings.

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