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Self-access learning and Minecraft: Observations and student perceptions

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Abstract

Minecraft is an interactive virtual sandbox game that came out in 2011. The authors created a Minecraft server for their students at a private Japanese university to expand the offerings of their Self-Access Learning Center. While Minecraft has been shown to promote communication and collaboration in a structured course, it is unknown if this can be replicated in a less structured scenario. Over the course of a year, students were able to access the server anytime from anywhere. All students who used the server were asked to use an "English Please" mentality. English was not strictly enforced but instead encouraged with a focus on communicative output rather than grammatical competence. The authors designed several events using the community of inquiry framework. Quantitative data was collected in the form of a student survey, recorded event attendance, and server log records. Qualitative data was collected through an open-ended survey, teacher notes and observations, and server chat records. From this data, many students appear to be interested in Minecraft, but only a few were interested in playing Minecraft while using English. Students who used the server regularly appeared to improve their English communication skills. The educational value of the different events is discussed, with group-based events believed to be the most valuable for building a community.

Keywords: Minecraft, self-access learning, community of inquiry

Introduction

In August 2021, the authors launched a Minecraft server in Sojo University's Self-Access Learning Center (SALC). Minecraft was positioned as a tool to be used in a social constructivist approach to learning English. In social constructivism,

meaning is constructed through interactions with others (Kalina & Powell, 2009). In line with second language acquisition concepts expressed by Firth and Wagner (1997), the authors stressed communicative competence rather than grammatical competence for language to be learned through social interactions while playing Minecraft. The rationale for choosing Minecraft, technical issues, and some of the activities used in this study have been described in an earlier paper by Remmerswaal (2022).

Minecraft is an open sandbox game, meaning that rather than a predetermined goal or linear gameplay style, it is a space that allows for creativity. Within the game, blocks can be arranged and structured to build or mimic anything from the real world (Nebel et al., 2017). It is the best-selling game of all time, with 238 million units sold (Microsoft, 2021). Minecraft was released in 2011; however, In the past five years, player numbers have tripled from 40 million to over 140 million (Statista, 2021). The participatory culture of the game allows for creativity and communication (Stevens, 2021). Playing Minecraft collaboratively elicits the language needed for problem-solving, creativity, and collaboration (Chien, 2019). While there are many collaborative games available, Minecraft allows the teachers to create their own Minecraft server easily, thus retaining the ability to moderate users, content, and tasks, ensuring a safe place for students. It was these factors, along with the low barrier to entry, that led to the decision to introduce the Minecraft server in the SALC (Remmerswaal, 2022).

This exploratory paper looks at the first year of Minecraft in the SALC. Student participation in the Minecraft server was voluntary, with no commitments necessary to play. Students were encouraged to participate in various events, some face-to-face and others with remote participation, with the server always open for unstructured play. A crucial part of online play is a community, as it gives a purpose for being in-game and allows students to learn and improve from each other (Stevens, 2021). This study looks at the way students and teachers use Minecraft through the lens of a Community of Inquiry (CoI) (Garrison & Arbaugh, 2007). The research questions are:

1 Are Sojo University students interested in playing Minecraft while using English?
2 What Minecraft activities are conducive of an education experience, as defined by CoI, within a SALC?

Literature review

Gaming as a learning tool has the ability to create fully engaged participants who are proactive, collaborative, reflective, critical, creative, and innovative problem solvers (Gee, 2013). Gaming promotes a participatory culture with systematic thinking and experimentation (Squire, 2011). Learning in games can be made socially meaningful, a notion put forth by Vygotsky (1986), as learners can interact with peers, teachers, and experts. Games allow students to immerse themselves

and experience the environment rather than simple written or visual descriptors (Bogost, 2011; Nguyen, 2016).

Minecraft has appeared in a number of peer reviewed papers for learning in a variety of contexts (Alawajee & Delafield-Butt, 2021; Baek, et al., 2020). There are endless possibilities of what can be built in Minecraft. This allows students to engage in their own way and leads to distinct outcomes for each individual (Marcon, 2013). Several studies have demonstrated that Minecraft can increase motivation, creativity, as well as communication and collaboration skills (Al-Washmi et al., 2014; Lorence, 2015; Pusey & Pusey, 2015; Uusi-Mäkelä, 2015; Callaghan, 2016).

In the context of language learning, a few studies found Minecraft allowed students to explore scenes from different stories and discuss and reflect on the content (Cipllone et al., 2014; Marlatt, 2018). One study used the characters and scenes from the game as inspiration for student stories and blog entries (Marcon, 2013). Others had students write journal entries or short stories in the game, for others to find and interact with (Uusi-Mäkelä, 2014; Lorence, 2015). Minecraft as inspiration for writing was summarized by Kuhn and Stevens (2017) to be ideal for language learning as the open and dynamic game makes the experience enjoyable and leads students to develop composition skills to describe their game experiences. There was an additional case of children becoming fluent in English through watching Minecraft videos, playing with a community, and then making their own videos to share (Smolčec et al., 2014).

Minecraft, when played on a server, is social. The experience gained by a learner through trial and error leading to the final product can be shared both in and out of the game (Cipollone, 2014). One study had students use written exchanges in the target language and found that success in the given tasks relied on the sharing of knowledge and resources (Uusi-Mäkelä, 2015). Another found that increased spoken communication facilitated collaboration between participants sharing expertise, creating objects, solving problems, or completing a building task; and improved teacher-student relationships (Callaghan, 2016). Participants reported enjoying the activities and improving their English through the collaboration needed for task completion (Swier, 2014). Similarly, Egbert and Borysenko (2019) found Minecraft was a prompt for discussions with 73% of the pre- and -in service language teachers from the study wishing to use Minecraft in their own language classes. In one case, first-time female users of Minecraft improved their collaboration and communication skills as they used expressive language when asking for assistance (Marcon & Faulkner, 2016). Both Petry (2018) and Nebel et al. (2017) found similar findings that collaboration led to increased learning and interaction.

Beyond language learning, Minecraft was shown to promote information literacy skills (Bebbington & Vellino, 2015) and digital literacy (Herold, 2015). However, there are a few areas of concern for teachers. One is it is easy for students to be off task, exploring or building something not connected to a goal. While some report Minecraft as being easy to learn (Smolčec et al., 2014), some pre-service teachers in McColgan et al. (2018) disagreed. They found the learning curve quite

steep for themselves as teachers, that tasks required a lot of time to design, and worried students may find the game too complex. Dykes (2021) remarked on a similar finding in his broad overview of using commercial off the shelf games in language learning, that using games like Minecraft to supplement English learning can be a time-consuming endeavor.

Despite these potential challenges, Alawagee and Delafield-Butt (2021) concluded that Minecraft can be a mediator between players and academic content in teaching first or second languages, in a well-designed lesson. In all the reviewed literature, Minecraft was either used in a classroom or for a set period of time, with specific students, in order to complete specific tasks. The researchers were unable to find an example of Minecraft used in an unstructured manner. This is why an exploratory study of Minecraft within a SALC is of interest. It may introduce new findings in the educational role Minecraft has when participants join as frequently or infrequently as they wish and when planned tasks must accommodate an unknown number of new and returning players.

Methods

Minecraft was available at any time on or off campus, with a purposeful educational experience for students facilitated through a variety of online and in-person activities for individuals and groups. This was organized through the framework of Garrison's Community of Inquiry (CoI). CoI is a model of the essential elements needed for a successful online higher education learning experience, which has also been used for hybrid learning (Drysdale et al., 2013). The goal of a CoI is to create a deep, meaningful, collaborative learning experience by developing the social, cognitive, and teaching presences. As can be seen in Figure 1, social, cognitive, and teaching presences overlap in CoI to create the educational experience (Garrison & Arbaugh, 2007).

Figure 1
Community of Inquiry Framework
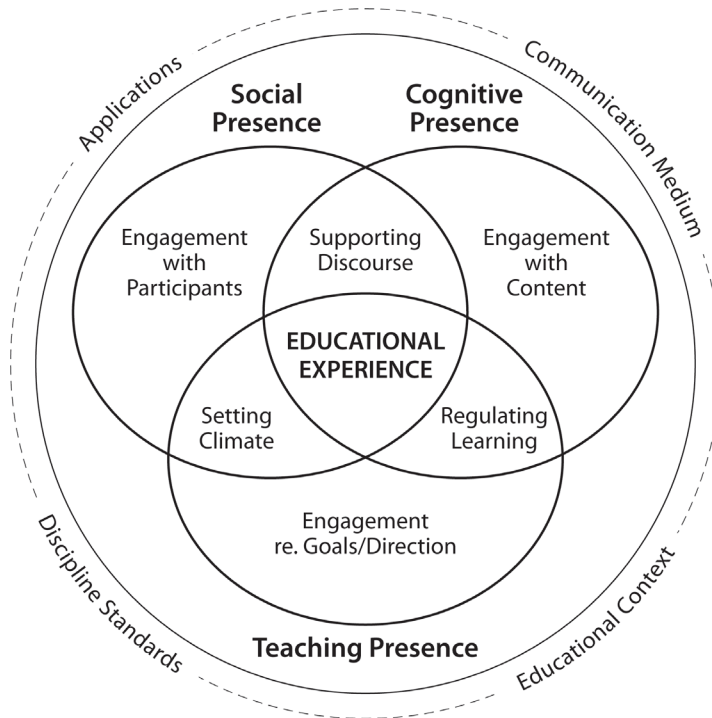
Note. From *The Community of Inquiry*, n.d. CC-BY 4.0

Social presence requires open communication, group cohesion, and effective expression. Students should be able to identify with the community in a trusting environment and develop their relationships while showing their personalities (Garrison, 2009). When collaboration and community are the goals, initial activities should center on exploring and negotiating expectations to create a climate for open communication (Garrison, 2009). Social presence was facilitated with in-person events, casual conversations in the conversation lounge, with the online social presence utilizing Teams, Discord, and in-game chat. Another benefit of Minecraft is the use of an avatar, which has been shown to increase collaboration and task performance compared to a non-avatar condition (Pan & Steed, 2017).

Cognitive presence requires a triggering event, exploration, integration, and a resolution. Some indications of these are information exchanges, connecting ideas, or the application of new ideas (Garrison & Arbaugh, 2007). These triggering events were the cognitive processes required to complete the tasks designed by the teachers. This could be searching for the correct English words to hold a short conversation, the words needed to collaborate, finding others to complete a task, or finding other ways to collaborate.

Teaching presence includes the design and organization of the class, the facilitation of discourse, and direct instruction. Some indicators of this presence

include shaping constructive exchanges and focusing on and resolving issues (Garrison & Arbaugh, 2007). Tasks were all designed for specific purposes. As part of the teaching presence, the authors actively participated in the Minecraft server and created events throughout the year. This allowed the authors to make changes and adapt the events and ways of communication as the year progressed based on student feedback and observations.

Data collection
To better answer the research questions, several forms of data were collected. These methods are summarized in Table 1.

Table 1
Methods used to answer the research questions

Research question	Data collection methods
Are Sojo University students interested in playing Minecraft while using English?	Survey 1
	Event attendance
	Server records
What Minecraft activities are conducive of an education experience, as defined by CoI, within a SALC?	Teacher notes and observations
	Server chat records
	Survey 2

Before investing in a server, Survey 1 was administered to students in late July 2021 and contained four questions related to Minecraft. These questions were asked in Japanese and trialed with two teachers to make sure responses were appropriate. The questions were designed specifically to understand if students had an interest in a SALC Minecraft server.

1) Do you play Minecraft?

2) At the SALC, if we use Minecraft to have fun and practice English a little bit, would you join a SILC Minecraft server? (You can build and compete with other students online).

3) What do you use to play Minecraft? (Choose one or more) (only available if the answer to question 1 was yes).

4) Would you like to receive emails with more information about SILC's Minecraft server?

The researchers were solely focused on Minecraft because of the flexibility of a server, the ability of the game to be cross played on any server, and its ability to circumvent some of the networking restrictions on campus. The survey was made to determine if students would be open to playing Minecraft collaboratively.

Server records and event attendance were then put in place to record the

activity of students. It is one thing to be interested in Minecraft and another to play Minecraft. While a survey can justify an initial commitment, actual use of the server is needed to demonstrate a true interest in the platform. The usernames of any person who joined the server was registered in the server (unique users), allowing the researchers to track the total number of unique users to join the server. Usernames are unique to each paid account and can only be changed for a fee paid to Microsoft.

The researchers primarily used observations to answer the second question, with Survey 2 and server chat records used as supplemental sources. The authors kept field notes during planned events and impromptu conversations with students in a manner detailed by Richards (2003). Impromptu conversations happened in both English and Japanese but were summarized in English. These summaries were typed into a Microsoft Form which included the date of the interaction, the site, number of people, notes on speaking patterns, types of student interactions (questions, comments, responses), room for other descriptions, and an area to suggest improvements. In reference to these notes, the two authors also completed a written reflection in June 2022. Both authors read the notes of the other and discussed any differences in what was observed at an event.

A large part of the educational experience relied on communication. From January 23, 2022, a plugin was added to record the chat history of students in the server. Prior to that time, a teacher was required to observe any chats in real time while playing Minecraft. This was not a reliable metric. With the addition of the plugin, all chats have been recorded since that date, including the username and time of the chat. This was used to understand the types of conversation during unstructured play.

The second survey, in January 2022, followed up with the respondents of the first survey via the emails they provided and included any other student who had joined the Teams group. Originally 130 students expressed interest in the Minecraft server, but most never took part in any activities. Other students only participated once. The researchers wished to understand some of the reasons students had for not attending, or their limited attending. The authors included five open questions and one multiple choice question. It was unclear at the time if the lack of participation was connected to Minecraft, the SALC, or the sharing of event information. These questions were asked in Japanese.

1) If you did not participate, why not? If you did participate, what did you enjoy and what would you like to see changed or added?

2) If you know Minecraft, which game mode do you like best? (Creative, Survival, PvP, Contest).

3) Information about SILC Minecraft was sent via Teams. Would you prefer to get information through other means, such as newsletters or email?

4) Have you participated in any SALC activities? (Please select all that apply)

5) May we contact you if additional questions arise? (If available, please provide email)

6) Do you have any other comments or suggestions?

Data analysis

Surveys 1 and 2 were administered with Microsoft Forms and analyzed within Microsoft Excel. Quantitative data was analyzed by category totals. Qualitative data was coded by both researchers synchronously with any differences in opinion negotiated between them. Researcher observations and reflections were reviewed and discussed by both researchers before their inclusion in this paper. Server data was exported from Discord into Microsoft Excel. Student conversations were reviewed and counted by both researchers, with no differences to negotiate. The chats included student-student (S–S), student-teacher (S–T), and teacher-teacher interactions. The researchers limited the chat count to S–S and S–T interactions that occurred in English.

Participants

English is a required course for two years at Sojo university. There are no English majors, and the average student English level is A2 on the CEFR scale. The SALC is available for all undergraduate and graduate students but is most frequented by first- and second-year students. The Minecraft server was aimed at these first- and second-year students as they attend English classes in the SALC building but was advertised throughout campus for all students. Both researchers were also participants in the events. From late April, Taiwanese students from the National Taiwan University of Education (NTUE) were invited to the server. These students were all studying to be English teachers.

Researcher positionality

The researchers both had experience playing Minecraft collaboratively with fond memories. One was particularly interested in Minecraft for students after witnessing his nephew improve his English as they played Minecraft together (Remmerswaal, 2022). Both researchers were interested in having more students participate in the SALC and believed Minecraft had the potential to draw-in students who may not otherwise utilize the SALC. This experience with Minecraft influenced the types and design of activities. The researcher's positive views of Minecraft is also a potential bias in the interpretations of what they observed throughout the year.

Minecraft event design procedures

Several types of events and modes of play were available to the students, including solo play, local group play, planned group play, and events (Remmerswaal, 2022). All the activities encouraged players to use the resources available to them, such as other students, teachers, or their smartphones to cooperate in English. These events were designed in consideration of the social, cognitive, and teacher presences for the CoI model. Table 1 describes these in more detail. It must be noted that the events were never designed more than two at a time. Typically, they were designed based on the results of the previous events. Table 1 represents what was planned whereas Table 2 describes what was observed.

Table 1

Description of each Minecraft event and the intended educational experience

Event description	Educational experience
Pre-launch event (September). Send the details to interested students. Let students explore the newly created world without instructions.	**Social Presence**: Students can build structures as a way to showcase personality and to spark future conversations. In-game chat is available. Teachers are accessible via email and Teams. **Cognitive Presence**: Students explore the world and find their own area to build structures. Students can make their structures before the official opening. **Teacher Presence**: Teachers can build their presence and interact with students or with the structures students build.
Halloween Build Contest (October). In creative mode, students build a Halloween themed structure. Each person uses a 50x50 square as a base.	**Social Presence**: In creative mode students are free to build without the need to gather blocks. This allows a showcase of personality. Students can discuss their builds in the conversation lounge, using in-game chat, and through Teams. **Cognitive Presence**: Using the area given to them, students decide the best way to use their space. They can learn from what others are doing or from online searches of Halloween builds. Hopefully they will become more comfortable in the server community. **Teacher Presence**: The teacher must create the designated areas either manually or with computer commands. The teacher should create an example for the students. The event and login details need to be available online and within the SALC with advertising wherever possible.
Minecraft Wednesdays (November and 2 weeks in December) Meet on campus with an online option. Play Player vs. Player (PvP) games. Students are put in teams or pitted against each other.	**Social Presence**: Students strategize in teams face-to-face or using Teams. Students must share their understanding of the game and their strategies to win. **Cognitive Presence**: Students are put into this arena and must figure out the rules of the game, a strategy to win, and how to utilize their teammates to defeat the map. Students quickly realize whether they truly understood instructions based on the outcome of their character movements. **Teacher Presence**: Teachers must find or build appropriate maps that can support different game modes and can be swapped in and out on the server. Students must demonstrate the appropriate vocabulary to work cooperatively and give assistance to students as they struggle to share meaning.

Let's Build Saturdays (November) Meet online to play Minecraft together in survival mode. Players can work on their own projects, on a shared project, or explore together.	**Social Presence**: Discussion is supported through Teams. Students are encouraged to assist one another, make suggestions, and build out the shared community that has formed. Students are able to take leadership roles and to demonstrate their skills or curiosity.
	Cognitive Presence: Students interact with their environment, either exploring or building what is of interest to them. Students can choose to follow other players or to stay in their own area.
	Teacher Presence: The teacher must have some building projects in mind or an area to explore. The teacher can ask about what students are doing and where they want to go in order to spark conversations.
Christmas Build Contest (December) Similar to the Halloween event, students build Christmas structures on a 100x100 square area.	**Social Presence**: This is a second opportunity for students to showcase their personalities and learn about other students through what they build. With a stronger understanding of the other members, there is increased opportunity to speak with other members about their builds using in-game chat, Teams, or in the conversation lounge.
	Cognitive Presence: Using the area given to them, students decide the best way to use their space. They can learn from what others are doing in their spaces or from online searches of Christmas builds.
	Teacher Presence: The teacher must create the designated areas either manually or with computer commands. The teacher should create an example for the students. The event and login details need to be available online and within the SALC with advertising wherever possible.
Unstructured Play (upgraded in January, but always available) The server is expanded to allow multiple game modes and multiple maps to run concurrently. Students are encouraged to host their own events or meet on the server with friends.	**Social Presence**: Students continue to have access to in-game chat and Teams for their own chats, as well as face-to-face meetings they plan. Students are encouraged to plan events in the Teams chat so others can join. Students can now interact with the teacher asynchronously through written or video reflections.
	Cognitive Presence: Students continue to interact with the environment and work collaboratively on their own schedules. Students are able to reflect on their journeys as well as practice using English using written and/or video journals.
	Teacher Presence: To allow more creativity and exploration, multiple worlds are combined using a plug-in. Students can travel through in-game gates to switch between mini-games, creative mode, and survival mode. Students are given freedom to create their own events, work alone, or play with friends. A journal tool and a video log tool are also given to encourage reflection of learning.

Build-a-bed (April) Start the new school year with a contest. Students build a bed on the server, take a screenshot and fill out a short form for a chance to win a gift card.	**Social Presence**: Students are incentivised to join an existing community without showcasing their own skill. New students can explore and see what exists in the server world before demonstrating their own skill.
	Cognitive Presence: Students join the server to complete a simple task and enter a contest. From there, they can explore and learn about the other students in the community simply by exploring what has already been built.
	Teacher Presence: The teacher must create a form and a how-to page for students to upload their information. The teacher must be available for questions and advertise the event.
Protect your Village (May, single day) A collaborative event held between Sojo University and the NTUE. Students work together in groups to defend a village. Each group is teleported to an existing village and builds defenses against mobs as well as new buildings to improve aesthetics, all while in survival mode.	**Social Presence**: Students communicate through discord with their teammates. Students share their ideas on how to protect the village or to make it more aesthetically appealing.
	Cognitive Presence: Students use the blocks they have accumulated and search for new blocks to build and defend their village. They must share the resources they have and plan the collection of new resources to accomplish their building goals.
	Teacher Presence: The teacher must create portals to villages throughout the world. The teacher must create a form to gather the information of interested students and divide those students into teams. The teacher creates a how-to guide and explains the contest at the beginning of the event. The teacher must rotate through the different groups to spark conversation, troubleshoot any issues, and offer support for the challenge.
Minecraft Wednesdays (June and July) Meet on campus at a time most players are available. Play in survival mode and work together to build and explore.	**Social Presence**: Students communicate with others in the room. Students can teach each other, work together, and interact with the teachers.
	Cognitive Presence: Students interact with their environment, either exploring or building what is of interest to them. Students can choose to follow other players or to stay in their own area.
	Teacher Presence: The teacher must have some building projects in mind or an area to explore. The teacher can ask about what students are doing and where they want to go in order to spark conversations.

Destroy the Warden (July, single day) Students from both Sojo and NTUE work together to defeat the warden mob. Groups teleport to different warden areas. The first team to kill the warden is the winner.	**Social Presence**: Students communicate through discord with their teammates. Students share their ideas on how to defeat the warden in the most efficient way including how to share the resources they each have. **Cognitive Presence**: Students use the blocks they have accumulated and search for new blocks to kill the warden. They must share the resources they have and plan the collection of new resources to accomplish their goal. **Teacher Presence**: The teacher must create portals to different warden sites. The teacher must create a form to gather the information of interested students and divide those students into teams. The teacher creates a how-to guide and explains the contest at the beginning of the event. The teacher must rotate through the different groups to spark conversation, troubleshoot any issues, and offer support for the challenge.

Ethical considerations

Both surveys required explicit consent from participants before they could answer questions. Students were made aware that chats were recorded in the Teams and Discord channels, as a welcome message within Minecraft, and on the how-to website. Any personal information that was collected has been anonymized for this publication. Institutional ethical approval was received from Sojo University.

Results

The researchers provided all English teachers of first- and second-year students with a link to survey 1 to give to their students. The possible pool of respondents was roughly 1600 students, but not all instructors made the survey link available to their classes. This was likely due to other surveys teachers often administer at that time for their research and a desire not to cause survey fatigue. The initial survey demonstrated some interest in Minecraft. From the 245 responses, 130 students indicated an interest in Minecraft for English, and 63 were active Minecraft players. With this information, the researchers proceeded to launch a server. While 130 students were interested in a Minecraft server, event attendance shows that fewer students would join Minecraft during planned activities. Table 2 describes the teacher observations of each event along with the total attendees (n=students unless otherwise indicated, N=total players including teachers). There are several students whose observations of their interactions were remarked upon. Aliases will be used: Yoshi, Kaneda, Tetsuo, Akira, Yuki, and Ken. All observations are in reference to the summarized field notes, reflections, and discussions of the two researchers.

Table 2

Summary of observations and the educational experience of each Minecraft event

Event observations	Educational experience observations
Pre-launch event (September) One student created an incredible base that took many, many hours to compete. Another student created a giant hole. A third student joined, but a structure was not found. n=3, N=5 	**Social Presence**: One student communicated via in-game signs with the teacher. A second student sent a request via Teams for the teacher to increase the world difficulty. The third had no visible presence on the server. No apparent S–S interaction. **Cognitive Presence:** The two students explored the world and built structures. Students were able to make their structures before the official opening **Teacher Presence:** One teacher built a home and created some areas for students to explore and collect swords and armor.
Halloween build contest (October) In creative mode, students built a Halloween themed structure. Each person used a 50x50 square as a base. Each student had a very different structure. Teachers scored each structure and chose a winner, seen in the picture below. n=5, N=8 	**Social Presence:** Three of the students who participated spoke about the contest in the conversation lounge and asked questions. Two participated online only. There was no apparent S–S interaction. **Cognitive Presence:** The students used their areas well and created some amazing buildings. The three students who spoke with the teacher gained familiarity with the teacher, but other community bonds may not have been formed. **Teacher Presence:** The teachers created their own buildings for the students to view when they first arrived. Instructions were posted within Teams and posters with QR codes put up throughout campus.

Minecraft Wednesdays (November and 2 weeks in December) Two students were somewhat regular attendees. Four students visited one time only. Yoshi was a regular member in November, May, June, and July. In December, students Kaneda and Tetsuo were regular attendees. Other members typically attended only once. When Akira attended his first and only Minecraft Wednesday, he expressed how shocked he was that it was a teacher-led event (personal communication, November 17, 2021).
n=0-4 N=2-6 (min-max attendance)
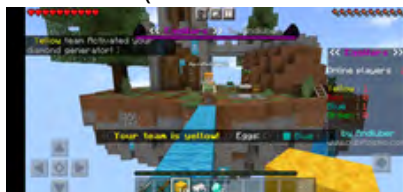
Social Presence: Students used limited speech to coordinate their efforts, often using sounds to express dying in game, or being hit. Students could answer teacher questions and follow instructions to some extent. Students attempted S–S verbal cooperation with some success.

Cognitive Presence: Students demonstrated a knowledge of the rules and the ability to play the minigames. Cooperative ability grew over time. Student vocabulary did not clearly grow, but the ability to speak English while playing increased.

Teacher Presence: The teachers found several maps to play. Most worked well, but some had problems. Each map change required a server restart. Teachers were necessary to encourage interactions and elicit speech from students. Teachers provided vocabulary support on a few occasions within each active session.

Let's Build Saturdays (November) Students met with a teacher on Saturdays for one hour of survival mode play. Yoshi and Kaneda were regular attendees. Conversations were held through MS Teams and were usually teacher-led. At the end of this event series, both students expressed interest in continuing to meet on Saturdays. One author explained that students could continue to use MS Teams and play together on Saturdays; the MS Teams channel was open for students to use it. However, both interested students stated they were uncomfortable starting a call independently (personal communication, December 3, 2021).
n=2, N=3

Social Presence: The teacher initiated the Teams call and initial conversation. One student would only speak when spoken to. The second student would ask questions and give some ideas of what they wished to do. Conversations were not complex, but understandable.

Cognitive Presence: Students and the teacher built out their own homes, explored the Nether area, and visited an ocean monument. S–T cooperation strengthened and vocabulary during discussions became slightly more complex with time.

Teacher Presence: The teacher suggested building a shared home structure, but each student wanted their own structure. The teacher often visited the two areas and offered resources or negotiated a sharing of resources between students.

Christmas Build Contest
(December) Similar to the Halloween event, students built Christmas structures on a larger 100x100 square area. Students occasionally sat together to build in Minecraft but were very focused on their own projects. Teachers scored each structure and chose a winner, seen in the picture below. While Kaneda was an active participant in the Halloween event, he made it clear that he was uninterested in another creative mode event (personal communication, November 25, 2021). In fact, only two participants from the Halloween event took part in this event.
n=6, N=9

Social Presence: The personalities of the students could shine through in this project. Students were able to share what they were building with the teacher with some detail. Very little S–S communication.

Cognitive Presence: From a creative standpoint, students used their spaces very well. There were snowmen, grinches, a sleigh with a reindeer, a temple, and a building with moving walls. Students interacted with each other's structures, if not with each other.

Teacher Presence: The space was created using a flat map and commands to layer 100×100 areas with snow. Both teachers created their own Christmas themed buildings. Like all events, posters were put around campus with a QR code and details in Teams. The teachers engaged in many conversations with the players about what they were doing. Often while playing, but other times conversing without playing the game.

Unstructured Play (Changes from January) Unstructured play was available in September and November as well, but creative mode contests prevented world exploration in October and December. From January, a survival mode world and a creative mode world were simultaneously available. Students were encouraged to host their own events or meet on the server at will. One event was proposed by a student, where students and teachers built a railway over a Teams call. Students built their own structures independently during this time as well.

Social Presence: Students used in-game chat to speak with each other, occasionally at first, but with more frequency in May, once Taiwanese students were joining the server regularly. The one train station event had two teachers and two students collaborate on a train station design, the places the tracks could go, and negotiate who would provide which resources for the station.
The new journal tool was used twice by one student. The video journal was never used.

Cognitive Presence: After greetings, resources within the game were the main cause for communication between students. Students had their own building goals and typically asked for specific blocks to accomplish them. There was no S–S communication related to working together to build a structure.

Teacher Presence: The teacher added a plugin that allows multiple worlds to exist simultaneously. Another plugin was added to record in-game chats.
The teachers created a website to host all how-to guides and server information. The website included a journal tool and a video log tool to encourage reflection of what students were doing in the world and to give students a chance to use English asynchronously.

Build-a-bed (April) Four first-year students joined this contest and one student who had participated in previous events also joined. The four new students joined the protect your village event as well.
n=5, N=5

Social Presence: New students did not interact with other students through in-game chat. This was likely due to the timing of joining the server when no other players were active.

Cognitive Presence: Students explored and learned about the other students in the community to some extent, seen by their beds being built near other structures.

Teacher Presence: The teachers created a form and a how-to page for students to upload their information. The teacher advertised the event throughout campus.

Protect your Village The teachers planned a collaborative event between Sojo University and the NTUE. Students worked together in groups of 5-6 to defend a village. Each group teleported to an existing village and built defenses against mobs as well as new buildings to improve aesthetics, all while in survival mode. Teachers scored each village after one hour and declared a winner.

When asked about the experience, three students all reported that the event was enjoyable, but it was challenging to communicate with their team. Yuki explained he was hesitant to initiate the conversation, and the event ended as he started to feel comfortable (personal communication, May 6, 2022). During the conversation with Yuki, Ken interjected his shock that his friend had joined the event. He stated he would not be comfortable using English to play Minecraft (personal communication, May 6, 2022).

Japanese students n=7
Taiwanese students n=14
Teachers n=3

Social Presence: Students communicated through Discord with their teammates. Students shared their ideas on how to protect the village to some extent, with some students simply building on their own. With teacher intervention, teams all increased their communication and began to work more cooperatively.

Cognitive Presence: Students used their blocks to build walls and towers within the village. The sharing and categorization of blocks was the main point of communication.

Teacher Presence: The teachers created portals to the villages, though a glitch created some problems. Students were assigned to have a mix of Japanese and Taiwanese students. Teachers rotated through the different group chats to give advice, encourage group cooperation, and to assist, when possible, often by giving blocks.

Minecraft Wednesdays (June and July) Students in the Minecraft Teams channel were asked for their availability, with Wednesday afternoons having the most overlap. One student was a regular attendee, a second came twice. Five students joined once.
n=1–3, N=3–5

Social Presence: Students communicated with each other in mostly English, with some Japanese support. Students taught each other how to play. Students responded to teachers and described what they were creating or asked for assistance.

Cognitive Presence: The regular student used his resources to assist new students in creating their own structures or homes on the server. There was some cooperation with building. A teacher or student would give a tour of the community structures for new students to see and explore for themselves.

Teacher Presence: The teachers planned activities such as a railway expansion, exploring a Nether Fortress, and finding a luscious biome. Teachers often initiated conversations by inquiring on what students were building and offering assistance.

Destroy the Warden (July**)** Students from both Sojo and NTUE were invited. The date was near exams in Japan and a month into the Taiwanese summer vacation.
n=1, N=3

Social Presence: The student joined through Discord, but was unable to speak, but could listen. In-game chat then allowed for responses.

Cognitive Presence: The players all experimented with different ways of killing the warden. This included swords, TNT, fireworks, axes, and fire.

Teacher Presence: The teachers created portals to the wardens. When there were no teams, the teachers created a new challenge of killing multiple wardens. Teachers initiated most conversations, but this was a technology issue as well.

Note. All pictures were taken as screenshots during gameplay. n represents the number of students participating. N represents the total number of participants.

Beyond the attendance of the events, students were able to join the server for un-structured play. The server record of unique players along with the server record of chat histories is displayed in Table 3. Unique players include teachers and the five SALC devices with unique player IDs. Multiple students shared these devices. A few players may be represented twice if they have different identifiers on different devices. There were a number of events that took place between Sojo University and the NTUE. The only data collected on the Taiwanese students were the number of participants and the number of chat interactions when a Japanese student was in the conversation. The final two rows refer to messages sent using

the in-game chat function. Days with an in-game chat refers to any day with at least one English message sent within Minecraft. Total exchanges via in-game chat refer to the number of English messages sent with at least one Japanese student participating in the conversation. There were several cases of students sending messages in Japanese or Mandarin, but these were excluded from the totals.

Table 3

The number of users and in-game chats in the Minecraft server.

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Number of unique players	5	18	*	24	25	27	31	50	68	71	72
Days with an in-game chat	X	X	X	X	X	7	1	5	17	8	4
Total exchanges via in-game chat	X	X	X	X	X	155	15	172	282	84	34

Note. All available data is presented here. "X" reflects data that was not collected by the server. * represents a change in server, unique users reset to zero in November. The researchers did not record the number of new users that month.

In-game chat

The number of unique players, to a limited extent, shows a willingness to play Minecraft. Attending in-person and online events is another indicator. Using English in in-game chats during unstructured play is an indication of a desire to play Minecraft in English. It is also an opportunity for an educational experience. After the researchers read the chat logs, the following types of interactions were recorded. There were 16 players who used in-game chat, most of the chat interactions involved Tetsuo, but an additional four students used the chat on at least five occasions. In February and March, chats were all S–T conversations to facilitate game cooperation. From April, interactions were S–T and S–S interactions. The S–S chats were between Japanese and Taiwanese students, welcoming them to the server and some conversations to cooperate. May had the most amount of chat interactions. There were many S–S interactions between Japanese and Taiwanese students cooperating. Other communications were basic greetings. In June, most English communication was S–T with two students and a few S–S greetings between Japanese and Taiwanese students. July saw a large decrease in interactions. These were S–T cooperation and S–S short greetings. One observation was how students often missed seeing another student by a few minutes. Being alone on the server demonstrates an inability to use English rather than an unwillingness to do so.

Other than large events, which included video calls, chat was the only known way students interacted with each other when not physically present. Video calls were possible for students through Teams and Discord, but no student-led calls

were observed. Students and teachers would also discuss Minecraft in the SLAC's conversation lounge and occasionally play together. There were four instances of Local Group Play registered on the server from April to July 2022. These involved two to three students using the SALC devices to join the Minecraft server together. Their spoken language is unknown, but the SALC encourages students to speak English. Yoshi used the option to journal after solo play twice, and the video option was never used.

Second survey

After the second event in December, the authors wished to understand why students were not joining the server initially or returning to events. Of the 24 players who had accessed the server, only five were well known to the authors and three were teachers. The second survey was given in January 2022. The researchers emailed the survey to the students from the original survey who had expressed interest in Minecraft and students who had joined the Minecraft Teams channel. This was a total of 161 students after duplicates were removed. Only 15 students responded. Eight students indicated they were too busy to join. Five students replied that they were unable to connect to the server or did not have a personal copy of the game. Only two respondents had joined, and their reason was "because it was enjoyable." The survey also revealed that survival mode was by far the preferred mode of gameplay and that there was no clear preference for communication. Nine participants, who did not play Minecraft, indicated that they did not participate in any other SALC activities. Three students indicated that they participated in 1-2 SALC activities, and three students, including the two who had joined the Minecraft server, had indicated that they participated in all activity types offered at the SALC. From these results and in light of the observations of the researchers, a website was created for onboarding future participants to the SALC Minecraft server. The SALC device count increased from one to five, and the authors decided that future events would have a group focus.

Discussion

There are several limitations to this paper. The first is that it cannot be generalized beyond participants at Sojo University because of the small participant sample size. Another limitation was the access to students. The first survey was not given to all first- and second-year students. While over half of the 243 students were interested in the server, it is unclear how many students from the pool of 1600 were uninterested and chose not to partake in the survey rather than students who were never given the survey. The second survey had a very low response rate. While the results provided ideas for how the authors might improve the server at the time, they were far from reliable, again, due to the small sample size. The questions in both surveys were trialed with other teachers, but not with students. It is possible students misinterpreted the questions. The server data on unique users only indicated the first time a user joined the server, not the total time

played or other metrics of server use; these metrics could have given a greater understanding of how students participated in the server. Finally, observations, coding, and review were all limited to the two researchers. Both researchers enjoy Minecraft and played alongside the students during this study. This presents a potential bias in the reporting of events.

The researchers witnessed collaboration and communication, both S–S and S–T. This is in line with the collaborative and communicative results of other studies (Callaghan, 2016; Egbert & Borysenko, 2019; Swier, 2014; Marcon & Faulkner, 2016; Petty, 2018; and Nebel et al., 2017). However, collaboration and communication were only observed as S–S interactions after a teacher encouraged the interaction, or after an event where communication had previously occurred between students. It appears that the Halloween and Christmas build contests did not encourage communication and were not effective activities for building a social presence. The in-person events as well as the group based Defend your Village event were a great opportunity for students to begin social interactions. These events all required a teacher to begin those social interactions before S–S interactions occurred. This is very similar to the previous studies, which had the same students participate throughout the study. The assumption that students will start a chat with another student based on a building they designed did not hold true. The teacher supported connection appears to be a great catalyst that can assist communication in unstructured play. In fact, this teacher supported focus on introductions and putting a focus on the goals of collaboration are recommended until members are comfortable in the community (Garrison, 2009). One way to improve comfort in the community could be to have an ice-breaking activity between students before beginning the main challenge of an event.

The length of time needed for these teacher-supported introductions is unknown. Events can take a long time to plan and promote. Each year there will be new students at the school, indicating that each year this support will be necessary. This is a weakness of Minecraft in the SALC, similar to the points made by McColgan (2018) and Dykes (2021); designing events can be very time consuming. While this teaching presence may continue to be necessary, the events may take less time to plan if successful events can be replicated each year. The teaching presence does not require a teacher, a student can take on that role as they mature in the community. This time commitment must also be weighed against the number of students it benefits. In the first year, no more than seven students participated in a single event. This level of participation may not warrant the time commitment required to prepare the events.

One area that was very underutilized were the written and video reflections that were given as a source of asynchronous learning. Within a classroom setting, these were found to be conducive to learning (Kuhn & Stevens, 2017; Uusi-Mäkelä, 2014; Lorence, 2015; and Smolčec et al., 2014). In this instance, the only two entries were from the most engaged student. Offering this option to participants requires very little time or effort and is in line with the SALC goal of supporting all

English skills. It may be unlikely to expect students to voluntarily use these regularly, but providing the option is worth the effort.

Conclusion

In this study, students had complete access to a SALC managed Minecraft server to use as often or as little as they wished. The Minecraft server had 72 unique players throughout the year. Many students appear to be interested in Minecraft as indicated both through surveys and general observations of students through daily interactions in class and SALC conversation sessions, but only a fraction of those players were observed using Minecraft as a means to improve their English. Planned Minecraft events saw participation as low as zero students and as high as seven students from Sojo University. A total of 16 participants used the in-game chat function. This left a high number of participants who were using the server without attending events or communicating with others in-game. Data was not available for whether these participants used the server once or many times. There are several possible reasons for this, one is that students were only interested in a single event and not the others. Another is the reduced number of in-person classes due to Covid-19 restrictions, which reduced the amount of time students spent on campus. Finally, the overlap in students interested in both English and Minecraft may be lower than believed from the first survey conducted or the motivation in some students was not high enough to overcome first-time participation anxiety. Additional research is necessary to understand which types of events will draw students into the SALC server and to better understand what can be done to lower any participation anxiety, including perceptions students hold of the English proficiency that is necessary to participate.

In terms of the educational experience, students who joined multiple events appeared to improve their English communication skills. Researchers observed longer utterances with more complex vocabulary. The researchers did not observe the desired educational experience in a few activities. The first was the building challenges, which were not conducive to building a social presence as imagined. They did not provide a natural place for communication between students or between teachers and students. Unstructured play is also not conducive to an educational experience unless a social connection has already been established between students. Group based activities were the most conducive to an education experience. These required communication to be successful. Students who join may be shy at first but have all joined voluntarily. As such, a few questions from a teacher can spark group cooperation. Further research is needed on which types of group activities are best, for example cooperative, competitive, building, fighting, or a mix of these things. Another variable to consider is whether groups who work together and are committed to several weeks of play have differing results from students who are grouped randomly with whoever is present for that event. Minecraft in the SALC appears to have value, but the best way to leverage this technology has yet to be determined.

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