Minecraft and Language Learning

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James York appeared on my Minechat series in February 2013 and then again in November 2013. His Minecraft world has evolved so much over time that I felt that we needed an update, and I can only guess there will be future visits to his Kotoba Miners Minecraft world. I always cite James's use of Minecraft as a jaw-dropping example of Minecraft in education. I guess many people have struggled at some point to learn a second (or third or fourth) language, but how on earth can Minecraft assist with this? Read on.

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James York

I am an assistant professor of English at Tokyo Denki University, Japan. As part of my job, I teach an elective seminar class once a week on a research subject that I am interested in. This Minecraft project started during a seminar class in which I was using it to teach Japanese students to speak English. The project quickly expanded, and now the Kotoba Miners project includes a course for people to learn Japanese.

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I have a master's degree from the University of Leicester and am working on an EdD. My research is concerned with the development of a suitable teaching methodology to promote oral language proficiency in virtual worlds.

Project Summary

言葉 (Kotoba):

noun

1) a language; speech; (a) dialect

2) a word; a phrase.

miner 1 | m In |

noun

1) a person who works in a mine. A coal miner.

Based on these definitions, the idea behind Kotoba Miners (KM) is the use of Minecraft as a domain for the acquisition, or mining, of words—or more importantly, language, specifically Japanese and English.

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My history with language learning in virtual worlds and with the use of games started in 2005, when a friend asked me to start playing World of Warcraft (WoW). I had just moved to Japan and was just beginning my adventure with the Japanese language. I knew that WoW would drain any free time that I had, but I didn't want to give up learning Japanese, so I made a compromise. We decided to join a guild of Japanese players. This experience was invaluable on my journey to fluency and started my interest in the subject of online communities for language learning.

I am now teaching English at a Japanese university and conducting research on the use of games in language education. The head of my department told me that I could do a seminar class once a week on anything I wanted, so I decided to make my research into a class: learning English with video games.

But why Minecraft in particular?

I experimented with a number of virtual worlds and games as part of my research. I rejected massively multiplayer online games (MMOs) for lack of control over content and their often extremely specialized discourse (for example, Prot Warrior LFG SFK pst). I also rejected a lot of social worlds (such as Second Life) for their painful aesthetics, controls, and perceived distance between "users" and "content creators." That is to say, they appeared to be either one or the other rather than both.

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Minecraft is simple. From controls to aesthetics and even gameplay. This means that you spend less time learning how to navigate the game and more time learning and focusing on language. Additionally, it gives teachers and learners 100 percent control over content—content that is easy to create and use. All in all, it is a very appealing canvas for the creation of language learning activities and of locations for language practice.

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The KM project differs from other projects you will find in this book because it uses a Bukkit server (https://bukkit.org/) that is open to the public at all times. In other words, the KM server is not on a LAN, is not white-listed, and is not restricted in any other way. It would be difficult to conceive of the project in any other way, and the reason for this will become clear in the following pages. And although part of this project does take place in an educational institution, the main student body is made up of individuals outside of school or education, and most are adults with full-time jobs.

Project Goals

The main goal started out as:

Provide a safe, motivating, and immersive environment for my Japanese students to learn English.

However, this goal drastically transformed over the first six months of the project to what it is now:

Provide a safe, motivating, and immersive environment for my Englishspeaking students to learn Japanese.

This does not mean that the original goal has completely disappeared—I still teach English to Japanese students on the server—but I now focus more of my efforts on teaching Japanese. Why? We need to go back to the start of the project to understand exactly what happened and take a moment to consider and respect the phenomenon of emergence in online communities.

The server was initially set up with a few basic lesson ideas and activities to help my students learn English. It had no additional plug-ins and no security until a player from Finland offered to help me out. I gave him admin access soon after, and he is still with the project to this day. Next was to find English speakers to participate. I asked on the popular

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news website Reddit whether people would be willing to come onto our server once a week to help my Japanese students learn English. As part of this, I also mentioned that as my students' level of English was fairly low, the experience would also be a good opportunity for them to practice Japanese. The results were very positive. Once a week, my students logged in and completed activities with English-speakers that came from Reddit. Once the course finished, my students stopped playing on the server, but the native English speakers continued. I was suddenly faced with a server of English speakers who were interested in learning Japanese. It was this experience that started my interest in teaching Japanese and led to the creation of Kotoba Miners.

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Learning Objectives

There is a unified test for assessing Japanese ability, much like the Test of English for International Communication (TOEIC). This test is called the Japanese Language Proficiency Test (JLPT), which has five distinct levels: N5 through N1, where N5 is the easiest test and N1 the most difficult. The objective of KM is to enable students to pass the N5. Although there is no speaking component on the JLPT tests, the Japanese course I designed has a strong focus on speaking. The reason for this is that learning in a virtual world lends itself to social learning, where interactions with peers provide a fantastic opportunity to develop communicative competence.

Organizing the Project

The main tasks for this project were:

- Develop an appropriate, activity-orientated curriculum
- Develop activities
- Create the lesson buildings
- Input Japanese into Minecraft

The project required some time and tools:

- Teacher preparation time: Over 100 hours
- Project duration: Ongoing

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- Student time spent on project: Approximately 60 hours
- Minecraft environment: CraftBukkit
- Other tools: Google Docs; Language Cloud for homework, practice questions and videos; TeamSpeak for voice communication

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Curriculum Development

Curriculum development is the most involved part of any educational project, whether it is hosted in a virtual world or not. Personally, it helped me to set a concrete goal. In the case of KM, this goal was to provide students with the necessary knowledge to pass the JLPT N5 test. This helped organize the progression of the course and even the design of the buildings and learning areas.

Occasionally, however, the game itself—a particular activity or plug-in would inspire a lesson plan, and I would work backward from that.

Activity Development

I'll assume that you are aware of Minecraft's different game modes. **Table 9.1** highlights how these modes may be used for different language learning purposes. If such considerations are made, language teachers have immense freedom in activity design.

Table 9.1

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Minecraft game modes and example activities

GAME MODE	ACTIVITY	LANGUAGE LEARNING OUTCOMES	LANGUAGE EXAMPLES
Creative	Building together (something to be used in future classes)	Giving and receiving Prepositions of place Conditionals	Shall we use wool for the walls? Put the table in front of the window, please. If we use black for the floor, this room will be too dark.

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Table 9.1

Minecraft game modes and example activities

GAME MODE	ACTIVITY	LANGUAGE LEARNING OUTCOMES	LANGUAGE EXAMPLES
Adventure	Cooperative "escape the room" challenge	Imperatives Question formation Imformation sharing	Jump now! Move three blocks left. What can you see? Is the creeper still there? I can see only one block. How about on your side?
Survival	Play together with teacher- defined objectives	Verb tenses	What are you doing? What did you do? What will you do next time?

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Two-player co-op activities are a large feature on KM as a means to promote interaction. **Figures 9.1** and **9.2** show some of the KM world.

Figure 9.1 Guess who!

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Created with the aid of Citizens 2, a plug-in for importing custom nonplayer characters (NPCs) into Minecraft, the activity in Figure 9.1 requires players to choose an NPC, then take turns asking their partner yes/no questions about the appearance of the NPCs to ascertain which NPC they have chosen. Typical dialogue might be:

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Player A: Is it a man?

Player B: No. Does yours have a blue T-shirt?

Player A: Yes. Does yours have headphones?

Player B: Yes. Are you NPC1?

Player A: Yes.



Figure 9.2 Spot the difference.

The activity shown in Figure 9.2

was designed to promote the use of the present continuous test (for example, "I am playing baseball" as opposed to "I play baseball"). The way this was achieved was by placing a number of NPCs in each of two houses. The NPCs were all engaged in a specific activity. However, in each house some of the NPCs are doing the same thing, whereas others are doing different things. Typical interaction might be:

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Player A: What is Bob doing?

Player B: He is watching TV.

Player A: Oh! Here, Bob is eating breakfast.

Player B: OK, that is a difference. Is Rise swimming?

Player A: Yes.

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Survival play has been used in a similar vein to promote using comparisons, question formation, and different tenses. But you should avoid merely assigning players the task of "playing in Survival mode." With pre-determined goals, students have something to work toward and something to talk about. Separating players into pairs has the additional bonus of getting groups to talk afterward about what they did. The activity starts as a pair-work activity, and then expands into a group discussion at the end.

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Figure 9.3 Survival set up for comparison activity.

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The setup was to select a suitable selection of land, hide some resources and treasures, and then create a bedrock wall around the perimeter reaching from the bedrock level to the top of the map. After this, using the plug-in World Edit, it was possible to duplicate the whole area (**Figure 9.3**), creating multiple instances of the same arena for sets of pairs to play in. Next, we create objectives for the pairs. These objectives can be given a value of points for completing them ("XP" below) to encourage behavior in a certain direction. Objectives I created were:

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- Find the nether star (100XP)
- Equip both players with iron armor (50XP)
- Find a diamond (50XP)
- Raise 20 sheep and cows

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- Build a house with the following specifications (200XP):
 - Four windows
 - Bedroom
 - Table
 - Four chairs
 - Kitchen

After a certain amount of time has passed, stop the activity, split up the pairs, and partner with a player from another pair. Students can talk about what they did and didn't do, comparing their experiences.

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There are a number of things that can help. JLPT N5 vocabulary and grammar requirements are not officially made available, but a number of resources are available that provide a fairly accurate outline. With reference to these resources, I designed activities that would promote using such vocabulary and grammar. Additionally, any beginner-level textbook can provide sufficient activities, and a number were referenced as part of this project.

Plug-ins themselves can be appropriated for use as language learning tools (**Figure 9.4**). One specific example of this is the plug-in Build My Thing. This is a multiplayer game, similar to the popular game Pictionary, in which one person is randomly selected to build an object based on a keyword whispered to them, and the remaining players have to guess what they are building by typing words into chat. One useful thing about this plug-in is that you can create the plug-in dictionary yourself; for example, we created a custom dictionary of Japanese words.



Figure 9.4 Appropriation of existing plug-ins.

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The game can be used for a number of language learning objectives. By playing "as is," vocabulary can be learned, but if we overlook the "build and guess" play style, additional language-learning activities can be generated, such as:

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- The person in the middle doesn't build but describes the item whispered to them. The remaining players guess.
- The person in the middle doesn't build but answers yes/no questions from the remaining players (essentially re-creating the famous 20 questions game).

Lesson Buildings and "JP Road"

Students who learn with us on KM do not have a pre-selected textbook. All lesson materials come from within the game itself and are designed by us. Initially, I used Google Docs to share words, phrases, grammar tips, and lesson plans. The problem with this was that it was awkward going from Google Docs to the game, and I had a predisposition to host as much material as I could in the game world itself. In other words, I wanted to have to rely on external tools as little as possible. I now realize that other tools, such as Google Docs, have a purpose in KM for collaborative writing and reading lessons. From this notion, the development of a university building, or "learning zone," emerged. The problem was that the university would have to be huge to house all the material I wanted to cover. A modular design was instead favored and eventually chosen. Essentially, lessons would be housed in buildings known as the JP buildings, and these buildings would be in a row. This row of buildings was thus called JP Road.

Each floor of the JP buildings (Figure 9.5) represents a lesson.

Each building is arbitrarily devided into a certain number of floors, and the whole course is contained within ten buildings: JP1 through JP10. In each room, there are typically new words, grammar, and activities (**Figures 9.6** through **9.8**).

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Figure 9.6 New words.



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Figure 9.7 Grammar.



Figure 9.8 Activities.

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The JP Road design (**Figure 9.9**) was the most logical way of having all learning material in the same place, and there was no problem when only the first few buildings were complete. But as more and more buildings became filled with signs, the frame rate for most players (even those with high-spec PCs) dropped dramatically when they tried to navigate the area. This was disastrous for the road system and led to the developent of a new system. This was initially very frustrating, but now

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I am happy that this problem arose, because the evolution from JP Road to JP area has been a very positive experience.



Figure 9.9 Finished version of JP Road.

The current state of the learning area is shown in Figures 9.10 and 9.11. Buildings stands 15 chunks apart to ensure that only one building is ever rendered at a time. Activities surrounding each building are relevant to the learning material inside.



I am aware that people can increase the default number of chunks that can be seen, but

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Figure 9.11 Aerial view of the JP area.



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Japanese Input

Japanese input—or, more importantly, Unicode input—is not supported in Minecraft by default, but this limitation can be surmounted with additional plug-ins.

- Intellinput is a mod for the client-side version of Minecraft. It allows
 players to input Japanese directly into the chat box.
- Lunachat is a fantastic server-side plug-in that takes users' text, sends it to Google (not sure of the details), and brings back the Japanese characters for that text. The Japanese text is then shown in the chat box. The raw input is shown after the Japanese text. Figure 9.12 shows how this looks in the game.

Figure 9.12 Chat box.

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[E] [Teacher]Cheapshot これは日本語です(korehanihongodesu)

Internet relay chat (IRC) allows messages as text. It is possible to add an IRC channel to your server with CraftIRC. With an IRC, it is possible to type directly into the Minecraft chat channel from the external IRC channel. This also doubles as a good way to monitor activities on the server and participate in discussions even when you are not able to log in to the game directly.

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Getting Started

Unlike MinecraftEdu, which is very popular among teachers for its security and teacher-friendly controls, Bukkit has no inherent protection against griefing—the act of maliciously destroying other players' builds or stealing items. I highly recommend the following three plug-ins to prevent such griefing:

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- World Guard allows you to protect important builds so that they will not be destroyed by others. Additionally, it allows you to define the game mode for specific areas.
- Group Manager. With this, you can create a number of player groups whose permissions are customizable. The default groups are admin, moderator, builder, and guest. You can also add groups to World Guard areas, giving build access to only certain members.
- Essentials features a host of useful commands, such as /warp, /teleport, /gamemode, and /seen. You can grant permission to use these commands on a per-player or per-group basis if using Group Manager.

I also recommend these plug-ins:

- Dynmap is an interactive, online map of the game world. Very useful for seeing where everyone is building and to locate specific warps.
- Variable Triggers is a plug-in we rely on a lot at KM. It has a whole range of uses, but the one I use most is to cause signs in the game to whisper a URL to players when clicked.
- Citizens 2 and Denizens. We use these for the creation of interactive NPC characters.

Completing the Tasks

The Japanese course that I teach has been a long time in creation from the humble (read: shabby) buildings and scattered activities of the first implementation to the simple, aesthetically pleasing and practical area that it is now. This came about through trial and error, player feedback, and player contributions, so it is not easy for me to provide a

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step-by-step guide to creating a similar server. Although I can offer the following dos and don'ts.

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- 1. Start with a concrete objective.
- 2. Take inspiration from lessons you already teach outside Minecraft.
- 3. Make use of all game modes.
- Focus on creating a need to be in Minecraft. If the activity can be done without it, it is probably better not to use Minecraft.
- 5. Prioritize pair or small-group work to maximize individual output.
- 6. Create small goals within a larger, more holistic activity to focus student interaction from moment to moment.

In my opinion, the KM server will never be complete. This is not to say that it is an unfinished project but rather that it is constantly evolving, with new material always being added. At this point, I have a team working on building a city that will be used as the arena for an immersive roleplay-based curriculum. In other words, they have an airport, a train station, restaurants and other common shops, and a residential area. Each area has a specific roleplay activity in mind. We are working on a survival games map to pit player versus player.

Reflection and Assessment

This project has been a labor of love for well over a year, and although a number of activities could be re-created to be more engaging or Minecraft specific, I am very happy with the way the project has turned out. Feedback from students is generally positive, and the experience they are getting is the one that I envisioned: social learning with an emphasis on speaking and listening in a "real classroom in an unreal world." Or as another student described it, "textbook content without a textbook."

Project Future

One thing that I haven't been spending too much time on is how to study kanji (the Chinese characters used in Japanese). I personally used a system called "Remembering the Kanji," by James Heisig. A number of

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free online resources for studying kanji use this method, and a number of alternatives systematically teach kanji. Because of the low-resolution graphics of Minecraft, it is hard enough writing the roman alphabet using Minecraft blocks, let alone an incredibly intricate character such as "離".

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We have a weekly activity on the server called Let's Play in Japanese. As the name suggests, we play games together in Japanese. The class is not formal, and vocabulary and grammar are kept to a minimum so that we can focus on actually playing. We've mainly focused on Minecraft until now, but we are experimenting with other multiplayer games, such as Rust, League of Legends, and a Garry's Mod game called DarkRP. Player suggestions are also welcome. In a sense, the KM server hosts a formal, guided course in Japanese, and then we apply this knowledge to play other games together (including Minecraft).

Finally, I think the KM model is transferable for other languages. There is of course a need for language-specific buildings (such as those to explain the use of le, la, and l' in French, pluralization rules in English, and more), but most activities are very much transferable. So if any readers would like to teach another language with us, please get in touch!

Resources

Listed here are programs and tools that can assist with the Kotoba Miners activity:

- Kotoba Miners official homepage: www.kotobaminers.org
 This is where you can find the address to join our server, as well as discuss language learning with other students on the forums.
- Kotoba Miners blog: http://blog.kotobaminers.org
 Content that is related to the Kotoba Miners project, Japan, and language learning.
- Language Cloud: https://languagecloud.co/

I use this to create homework exersices for my students. It is very easy to create curriculum content, and it features a plethora of question types, such as fill-the-gap, multiple choice, written answer, matching, and so on.

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Planet Minecraft: www.planetminecraft.com

Very useful for getting large builds to import into your server. A lot of content here is freely available to use, but it is always a good idea to ask the creators if you can use their content.

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Bukkit: http://bukkit.org/

This website hosts the craftbukkit server files and all the plug-ins mentioned in this chapter.

- Additonal resources that have been mentioned in previous chapters include:
 - Minecraft homepage
 - Minecraft wiki
 - Google Drive

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