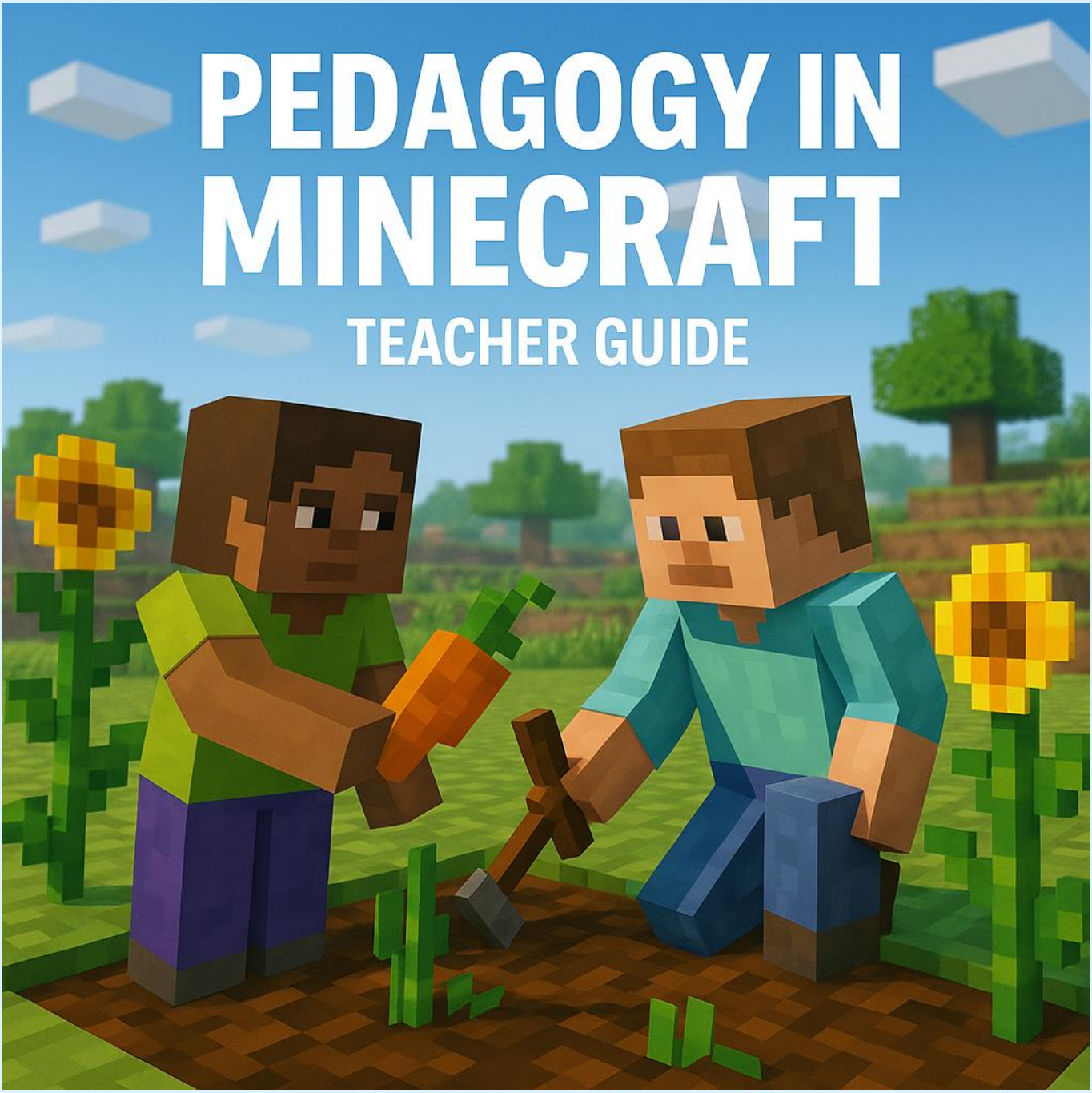
Minecraft for Global Classrooms

Teaching Sustainability Through International Collaboration



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Introduction

Welcome to the EXCALIBUR Erasmus+ project, an innovative educational initiative that combines virtual 3D game worlds, language learning, sustainability and STEM (Science, Technology, Engineering, and Mathematics) subjects. In this project, students from various European countries collaborate online using Minecraft, a popular video game adapted as a versatile and engaging educational platform. The goal is to foster creativity, critical thinking, communication, collaboration, character, and citizenship—the 6Cs of Deep Learning—in a multilingual and intercultural environment.

This teacher guide is designed to support you in integrating Minecraft effectively into your teaching practice. It provides clear pedagogical guidance on how to leverage Minecraft as a powerful tool for language development (CLIL—Content and Language Integrated Learning) and STEM education. Through structured activities, practical examples, and pedagogical strategies, you will learn how to facilitate meaningful, immersive learning experiences that motivate students and enhance their academic and interpersonal skills.

The following sections of this guide will:

- Walk you through the basics of Minecraft gameplay in an educational context.
- Provide essential classroom management strategies and pedagogical tips.
- Offer practical advice for integrating language learning and sustainability content seamlessly into Minecraft activities.
- Present guidelines for organizing collaborative projects, including international cooperation.
- Suggest effective methods for assessing student progress and learning outcomes.

We hope this guide empowers you to confidently introduce Minecraft into your classroom, making learning languages and STEM subjects an engaging and memorable experience for your students.

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Contents

Introduction 2
1. Getting Started with Minecraft 4
1.1 Introduction to Minecraft for Teachers 4
1.2 Technical Preparations (Placeholder) 4
1.3 Classroom Preparations 4
2. Teaching Minecraft Basics 5
2.1 Entering and Navigating the World 5
2.2 Building Basics 5
2.3 Problem-Solving and Collaboration 6
3. Pedagogical Strategies and Integrating Language and Sustainability in Minecraft 7
3.1 Core Pedagogical Principles 7
3.2 Facilitating Learning in Vanilla Minecraft 7
3.3 Integrating Language Learning Through CLIL and LOTE 8
3.4 Integrating Sustainability Learning 9
3.5 Reflection and Assessment Through Rubrics 11
4. Planning Collaborative International Projects 13
4.1 Foundations of International Collaboration 13
4.2 Project Framework 13
4.3 Structure of an International Project 15

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1. Getting Started with Minecraft

1.1 Introduction to Minecraft for Teachers

Minecraft is a highly engaging, versatile sandbox game that allows players to explore, build, and create within a blocky 3D environment. For a video game, it has enjoyed remarkable longevity, having first launched in 2009. For teachers, Minecraft offers an exciting platform to foster student-centered, experiential learning across various subjects. Unlike typical gaming at home, educational Minecraft use is structured to meet specific learning objectives, emphasizing collaboration, problem-solving, and communication skills. In the classroom, Minecraft encourages active participation, creativity, and critical thinking.

It also lends itself well to language development through interactive tasks that require teamwork, where students naturally use the target language to accomplish shared goals. Furthermore, its open-ended nature provides an ideal environment to create scenarios where students explore STEM concepts and sustainability.

This section introduces you to the basic concepts and educational advantages of Minecraft, preparing you to successfully facilitate learning activities and integrate them effectively into your curriculum.

1.2 Technical Preparations (Placeholder)

This section will cover brief technical guidelines to ensure your classroom is set up for Minecraft-based lessons.

1.3 Classroom Preparations

Preparing with your class effectively is essential for a successful Minecraft learning experience. Many students will have prior experience of the game, where they have adhered to a different set of rules. Emphasizing the differences between the structured, goal-oriented play and leisurely play at home can help prevent "cultural clashes".

In practice, it pays off to begin by establishing clear guidelines and expectations with your students. Discuss digital citizenship, respectful communication, and collaborative behavior explicitly, to create a supportive learning environment. Consider writing these guidelines together as a document with your class to increase ownership and student commitment. As the goal of EXCALIBUR is to foster international collaboration, this exercise can be undertaken at different levels: it can first be done locally for a single class and later expanded to cover the collaboration of multiple classes online.

Another crucial step to distinguish between educational and leisure play is to clearly outline the learning objectives and expected outcomes before each session. Sharing clear goals helps students understand the purpose behind their activities and motivates them to actively engage with the tasks. The best part is that this goal-oriented preparation is natural to games, so many students are often very receptive to this.

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2. Teaching Minecraft Basics

2.1 Entering and Navigating the World

Introducing Minecraft to your students should start with basic navigation and game controls. Even in a generic or flat world without preset maps, teachers can successfully guide students in mastering the fundamental skills needed to explore and create effectively.

Begin the first session by guiding students to:

- Enter the game and join the shared multiplayer environment.
- Practice basic movement (WASD keys for moving, mouse for looking around, spacebar for jumping, and shift for sneaking).
- Interact with the environment by collecting (breaking) and placing blocks.

Use simple activities like "follow the leader" or "find your partner" to familiarize students with basic controls. This also provides excellent opportunities for practicing directional vocabulary and simple instructions in the target language. Depending on the level of students, you can support these exercises by providing a cheat sheet with directions and basic terms.

Encourage peer support by pairing less experienced students with those who are familiar with Minecraft. This approach enhances collaborative skills, fosters language practice, and helps all students feel confident and included. Recognizing these prior skills can also boost self-efficacy for students who might not traditionally be top performers academically, so make sure to seize the opportunity!

2.2 Building Basics

Once students are comfortable navigating the Minecraft world, the next step is introducing basic building skills. This stage is crucial, as it allows students to express creativity and lays the groundwork for more complex collaborative projects later on.

In this session, guide students to:

- Understand how blocks are highlighted by pointing the cursor at them when the players are close to them.
- Practice simple digging tasks, such as breaking a barrier to move between areas. Make that students know how to dig above and below beyond just breaking things directly in front of the players.
- Practice simple building tasks, such as constructing basic shelters or simple geometric shapes.

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- Understand how to collect and manage inventory items. This can help connect the first two tasks: building something requires digging something. This can be a useful task to reinforce how sustainability works in Minecraft.
- Work in small groups to create a common structure, such as preset shapes or a simple house, fostering teamwork and communication skills.

Use these building tasks to introduce basic STEM concepts, such as counting and measurement, to lay a foundation for sustainability themes in future sessions. From CLIL perspective, these tasks have clear opportunities for language learning: vocabulary development by naming and selecting different blocks, simple dialogues within small groups or presenting of the creations at the end of the session.

2.3 Problem-Solving and Collaboration

With foundational skills established, students can now engage in collaborative tasks designed to develop collaboration and communication skills. The objective is to provide challenges that require communication, strategic thinking, and teamwork, and put the previously agreed upon guidelines on behavior and communication to test.

Activities might include:

- Constructing bridges or paths to connect distinct areas, which encourages students to discuss design and organizing material collection.
- Creating obstacle courses or puzzles that other groups must navigate or solve, facilitating strategic thinking and cooperative problem-solving.
- Planning and building communal structures, such as meeting places or marketplaces, emphasizing cooperation and community-oriented thinking.

These tasks not only foster deeper understanding of the game but also significantly enhance language skills through authentic discussions, negotiations, and presentations of final projects. They are also excellent at encouraging constructive conflicts that encourage students to invoke the rules themselves.

As a teacher, it is important to strike a balance between giving guidance and allowing creative freedom. Provide clear instructions and criteria but leave students space for their unique ideas and interpretations to flourish. Regularly check in to support and encourage innovation, without overly restricting student creativity.

These creative tasks enhance language skills through descriptive communication and vocabulary development related to the themes. You can also underscore creativity by having students describe their creations orally or in written form.

These shorter, individual activities (30-45 minutes) pave the way to the actual EXCALIBUR scenarios.

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3. Pedagogical Strategies and Integrating Language and Sustainability in Minecraft

3.1 Core Pedagogical Principles

Minecraft supports a constructivist, learner-centered pedagogy where knowledge is built through active exploration, collaboration, and reflection. In the EXCALIBUR context, this pedagogical foundation is enriched by intercultural dialogue and language immersion. Teachers act more as facilitators or coaches, providing structure and scaffolding while allowing students to take the lead in shaping the learning experience. Students' active role should be taken seriously and put into practice: more often than not they will know more about the game than you do!

A key strength of Minecraft is its ability to support both open-ended exploration and goal-oriented tasks. This flexibility allows teachers to design activities that promote creativity, autonomy, and personal expression, while still aligning with curricular goals in language and sustainability education. Open-endedness can be a double-edged sword, however, as too much freedom, too early, can lead to chaos. A class' capacity for self-directed play will increase over time and with practice.

Successful learning experiences in Minecraft emerge when the balance between freedom and structure is thoughtfully managed. Too much freedom can result in confusion and disengagement, while overly scripted tasks may stifle creativity. Teachers can maintain this balance by setting clear learning goals and constraints (e.g. design limitations, timelines, specific objectives) while leaving the process of achieving them up to the students. The example scenarios in EXCALIBUR will help you strike this balance.

Language development and sustainability themes are best integrated when they are part of the task's purpose, not an add-on. For instance, asking students to design a sustainable neighborhood and present their ideas in the target language naturally blends content, communication, and cognitive challenge—the core of the CLIL approach. Teachers should encourage frequent reflection and dialogue, making learning visible both inside and outside the game world.

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3.2 Facilitating Learning in Vanilla Minecraft

Minecraft offers a dynamic environment for interdisciplinary learning, even in its vanilla version without educator-specific controls. While it lacks built-in teacher tools such as those found in Minecraft Education Edition, meaningful structure and guidance can be achieved through pedagogical strategies and classroom routines.

Start by setting clear expectations for behavior, collaboration, and time management. As mentioned earlier, defining the session's objective in advance is important. If the world is persistent (meaning you will continue your work some other time, help students plan

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progress across multiple sessions. A good practice is to make plans before they set their feet in the virtual world. Often, it can prove difficult to pause the actual gameplay for planning as students are engaged with the tasks.

- To scaffold the planning, you can create templates or support questions each group has to answer before they enter the world. For building tasks, drawing blueprints or layouts in advance is a good idea. This can include researching real world constructions for inspiration.
- Encourage teamwork by asking the groups to assign specific roles to students within groups—such as planner, builder, researcher, and presenter — and rotate them over time to support equitable learning experiences. When situations arise in the game, guide them to ask which roles are needed to address it.
- As Minecraft is an open-ended game, there usually aren't in-game signs or user interface to guide gameplay. Instead, use social and verbal scaffolding to steer students. For example, if groups are working on a sustainable housing project, you can guide progress by setting checkpoints: “by the 20-minute mark, your team should have outlined the building’s footprint and chosen materials.” Use a timer to pace work, or a slideshow with phase of the task students should be focusing within the classroom and call attention to them at regular intervals.
- Assign meaning to in-game objects. For instance, ask students to mark the corners of their building site using torches to visually communicate boundaries to the group, or encourage each group to place a sign in front of their building site that states the purpose of the structure and what sustainability features it includes—preferably in the target language.

Observing gameplay is also essential. Circulate through the physical classroom and listen in on group discussions, noting collaboration dynamics, communication styles, and problem-solving strategies. If issues arise — such as unproductive behavior, off-task activity, or conflict — you can intervene by asking open-ended questions that redirect focus: “How does your design reduce environmental impact?” or “What are some alternatives you haven’t tried yet?”

If you are using Minecraft Education Edition, it includes useful tools like the Freeze and Chalkboard blocks that can extend some control to the game world. However, Education Edition can pose challenges for facilitating international collaboration, as creating shared worlds between multiple schools is challenging.

3.3 Integrating Language Learning Through CLIL and LOTE

In the EXCALIBUR project, language learning is not treated as a separate activity but embedded within authentic tasks in Minecraft. The project combines the CLIL (Content and Language Integrated Learning) approach with a LOTE (Languages Other Than

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English) perspective, making space for multilingual expression and fostering communication in diverse linguistic contexts.

CLIL supports meaningful communication and task-based use of language—English, German, or French—within content-rich projects. Meanwhile, the LOTE approach values the use of students' first or additional languages in multilingual settings, enabling learners to engage in intercultural dialogue and to develop language skills in context.

Minecraft naturally lends itself to both CLIL and LOTE because it creates immersive situations where language is needed to collaborate, problem-solve, and present ideas. In these scenarios, students are not just learning about sustainability or architecture—they are using language to co-construct meaning, explain their designs, and reflect on their learning.

Some practical strategies include:

- **Pre-task Vocabulary Support**: Before starting a building activity, provide a short glossary with key terms (e.g., "foundation," "solar panel," "green roof") and ask students to label their designs using signs in one or more target languages.
- **Structured Group Interaction**: Create discussion prompts or sentence starters to support in-game communication, such as "What should we build next?" or "Can you explain why we need this feature?"
- **Written and Oral Presentation Tasks**: Ask students to prepare short presentations of their builds, record voiceovers for a Minecraft tour, or write an in-game story set in their sustainable world.

Project examples from EXCALIBUR have demonstrated how well this works and you can find more information about them and other scenarios on the website (https://www.excalibur-project.eu/). For exampe, un the *Collaborative Sustainable Tourism* project, Finnish and Italian students worked together to create eco-tourism environments. English was used as a shared working language for presenting their ideas and discussing their design decisions, while native languages were also used for planning and support.

By focusing on real-world problems and shared goals, the CLIL and LOTE approaches in Minecraft promote deep engagement with both language and content. The EXCALIBUR approach supports communication as a process and helps students build confidence using language in complex, creative contexts.

3.4 Integrating Sustainability Learning

Minecraft offers a compelling space to explore sustainability themes in a tangible, collaborative way. Because the game world operates with its own internal logic and ecosystems, students can interact with the natural resources and terrain to simulate the real-world impact of human decision-making.

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One obvious limitation that needs to be addressed is the apparent discrepancies between the Minecraft world and the real one. The physics in Minecraft operate in a different way and many of the blocks aren't subject to gravity, to point an obvious difference. This should not be seen as an issue: you can ask students to identify differences which requires an understanding of the physics in the real world. There are similarities as well, such as resource scarcity, which can be used to express sustainability issues. Additionally, certain in-game functions such as setting water level in the world can be used to simulate rising sea levels.

In the context of EXCALIBUR, sustainability is approached through localized and cross-border projects. These often involve real-world scenarios such as eco-tourism, waste reduction, water conservation, and renewable energy design. Minecraft provides a sandbox to simulate, test, and present potential solutions to these global challenges.

Examples from the project include:

- Designing **low-carbon tourist destinations** with green roofs, solar panels, and walking paths, then presenting the reasoning behind the layout.
- Building **sustainable farming systems** and linking the yield to decisions made around water use and crop rotation.
- Simulating **climate-resilient housing** in flood-prone areas with elevated structures and permeable ground blocks.

Students can work in teams to plan, design, and present their worlds, embedding sustainability decisions in every layer of the build. Encourage learners to:

- Justify their material choices based on sustainability principles (e.g., using wood over obsidian).
- Reflect on the environmental and social impact of their decisions.
- Include signposts or voiceovers that explain sustainable features to visitors.

Reflection is a key component. After the building phase, teachers can facilitate discussions using prompts such as:

- "How does your design contribute to sustainability goals?"
- "What trade-offs did your group make when choosing materials or layout?"
- "Would this solution work in real life? Why or why not?"

Sustainability in Minecraft becomes most meaningful when it mirrors real-world complexity and requires students to balance creativity, practicality, and ethics. The EXCALIBUR project provides both ready-made scenarios and inspiration for designing your own.

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3.5 Reflection and Assessment Through Rubrics

Minecraft provides many opportunities for both formative and summative assessment through observation, discussion, and analysis of the materials students create. Designing assessment beforehand is important to build a bridge between the game and the classroom. It can also lend credibility to using the games both in the eyes of the students and other stakeholders, who sometimes need convincing and justification.

Rather than relying solely on final products, teachers can assess how students collaborate, solve problems, and use language and content knowledge throughout the process. To make sure this approach isn't haphazard, one of the most effective tools in this context is using rubrics.

Rubrics are structured evaluation grids that list criteria for success and describe varying levels of performance. While rubrics are commonly used in some educational systems, they may be unfamiliar in others. Think of them as transparent guidelines that help both students and teachers reflect on progress, clarify expectations, and support self- and peer-assessment.

A good Minecraft rubric might to assess an EXCALIBUR project might look something like this:

Criteria	Excellent	Good	Satisfactory	Needs improvement
Sustainability Design	Design shows deep awareness of sustainability; multiple eco-features included.	Design reflects some eco-conscious decisions.	Limited consideration of sustainability.	No clear evidence of sustainable thinking.
Language Use	Accurate use of target language and subject terms; clear communication.	Mostly accurate use of language and key terms.	Some language errors; limited vocabulary use.	Frequent errors; minimal or unclear language used.
Collaboration & Communication	Highly effective teamwork; all group members contribute equally.	Good teamwork; minor coordination issues.	Uneven participation; some conflict or confusion.	Poor collaboration; unclear or conflicting roles.

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Creativity & Functionality	Very original and purposeful build; innovative solutions evident.	Creative and mostly purposeful design.	Basic build with limited creativity or utility.	Disorganized or incoherent structure.

Encourage students to use the rubric actively to guide their approach during the planning and gameplay. At the end of the sessions, you can spend a couple of minutes to reflect in groups some of these aspects. This reflective part is crucial for learning as it connects the gameplay with learning outcomes. Self-reflection questions might include:

- "What was my role in the group and how did I contribute?"
- "What new words or concepts did I learn?"
- "What would I do differently next time?"

To make reflection more engaging:

- Ask students to create a guided tour of their project using signs or spoken explanations.
- Use screenshots as visual evidence during peer review.
- Let students vote on their favorite features from other groups with justifications in the target language.

In EXCALIBUR, teachers have used reflection and assessment not only to evaluate learning but to deepen it, prompting students to revisit and improve their designs or explanations after feedback. This iterative mindset reinforces both content mastery and communication skills.

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4. Planning Collaborative International Projects

4.1 Foundations of International Collaboration

Before launching an international collaboration, it's important to build a solid foundation with local colleagues you are planning to partner wih. Successful projects often rely on committed partnerships within your own school or region before going global.

Start by identifying teachers who are interested in interdisciplinary, language-enriched, or game-based learning. Approach language teachers, science teachers, or those already using project-based learning methods.

- **Clarify the Educational Value**: Emphasize how Minecraft supports curriculum goals, student motivation, and skill development in language, sustainability, and digital competence.
- **Share Success Stories and Identify Hurdles**: Use examples from past EXCALIBUR collaborations to illustrate what students have built and learned. Additionally, you can address some concerns your colleagues might have by explaining how issues have been solved in EXCALIBUR projects.
- **Define Roles Clearly**: Be transparent about expectations. For example, a language teacher might co-facilitate reflection sessions or help prepare vocabulary lists, while a science teacher could support topic research.

Encouraging a team-teaching model or offering flexible involvement (e.g. limited to a few sessions) can lower the threshold for colleagues to join in. Building trust locally is the first step to establishing a stable and enjoyable international experience.

4.2 Project Framework

International collaboration offers a powerful way to combine language learning, cultural exchange, and sustainability education. Minecraft provides an engaging virtual space for this cooperation, whether carried out in real-time or asynchronously. This section outlines how to structure such collaborations to ensure clarity, engagement, and a meaningful learning experience for all participants.

Collaborative projects can vary in duration, but a 4–8 week structure is recommended. This allows students to move through phases of orientation, research, planning, building, and reflection. Projects can be synchronous (live sessions) or asynchronous (teams work independently and report back), depending on time zones and schedules. Of course, a project might include both real-time and asynchronous collaboration.

Core Components of a Collaborative Project:

- **Shared Theme**: A unifying challenge or theme, such as designing a sustainable school, eco-friendly tourism district, or climate-resilient neighborhood.

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- **Defined Roles and Responsibilities**: Schools or groups can divide tasks based on strengths, such as design, research, feedback, or presentation.
- **Communication Plan**: Choose appropriate communication tools (email, video messages, shared docs) and set frequency expectations to maintain momentum.
- **Cultural and Language Exchange**: Integrate icebreakers, informal exchanges, and reflective tasks that help students understand their partners' backgrounds. These can take place both within Minecraft and outside.
- **Building Report or Portfolio**: A final written or multimedia report helps consolidate learning and provides an opportunity to practice language skills.

This framework serves as a foundation for the upcoming sections, which will guide you through each phase of a successful collaboration. Example formats from EXCALIBUR projects are included as inspiration, but the approach can be adapted to suit the goals and contexts of participating schools.

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4.3 Structure of an International Project

Below is a flexible roadmap for running a cross-border collaboration with Minecraft as the shared learning environment. This process is adaptable for both synchronous and asynchronous formats.

Step	Title	Activities and Tips
1	Orientation and Icebreaking	Begin with informal activities to build trust among students. Use icebreaker questions related to hobbies, culture, and sustainability. Introduce project goals and expectations. Establish communication routines (shared folder, messaging platform).
2	Research and Planning	Guide students to research sustainability themes (energy, transportation, water). Teach source evaluation and information literacy. Each group starts drafting their building plans.
3	Role Division and Task Assignment	Assign and rotate roles: builder, planner, researcher, communicator, documenter. Match roles with students' skills and interests to promote engagement and fairness.
4	Building and Collaboration	Begin building in Minecraft. Share progress through screenshots or videos. Exchange feedback between schools using shared docs or video walkthroughs. Update builds accordingly.
5	Presentation and Reflection	Deliver a final presentation (live or recorded). Reflect using guided questions. Submit final documentation (reports, diaries, media). Encourage peer feedback.

Each of these steps can be scaffolded with support materials from earlier EXCALIBUR projects. Teachers are encouraged to adapt the sequence and activities based on their students' needs and the realities of the school schedule.

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