

Usability Tests: How do Minecraft players learn to use new modification content?

CS 6650 Research Project by Skyler James

Process

The following mods were chosen for usability tests based on their level of complexity and the manner in which they present new information:

- Botania (by vazkii)
 - This mod includes a very detailed guide book to provide instructions
- Create (by simibubi)
 - This mod includes a unique “Ponder” menu to guide the player
- Farming for Blockheads (by BlayTheNinth)
 - This mod has a Market block with instructions
- JEI (by mezz)
 - This mod allows players to easily find items and crafting recipes
- Mekanism (by bradyaidanc, et. al)
 - This mod has extensive GUIs to use various features
- Switch-Bow (by White_Draco)
 - This mod has no instructions
- Timber Frames (by RasaNovum, et. al)
 - This mod has a small “Help menu” when using a specific item

Participants

Four players responded to invitations to join the study. For the purposes of anonymity, they will be referred to as User 1, User 2, User 3, and User 4.

Eligibility

To be eligible for the study, participants were required to:

- Be a legal adult (18+ years of age)
- Screen-share over Discord or Zoom
- Install Forge and a small custom modpack
- Spend up to 1 hour completing tasks

Risks

There are no risks associated with this study outside of the normal risks of playing modded Minecraft in a multiplayer setting.

Benefits

As compensation for their time, players were offered a \$10 USD gift card, or the equivalent in their local currency. Participants will be given access to the final conclusions of this study to allow them to benefit from the information that is gained.

Tasks

The purpose of each task was to determine how players learn to use new content. One task was designed for each mod. Some mods have special features to allow their content to be more discoverable, such as a guide book or tooltips. Tasks were designed to explore these questions:

- How does the player learn to use the mod?
- How does the player use the Creative menu?
- How does the player use JEI?
- How does the player use other Internet resources?
- What other resources does the player use?
- What causes the player to struggle?

After completing the task, players were asked the following questions:

1. How satisfied are you with your experience?
2. What helped you the most while learning to use this mod?

Preliminary Task

The first task was to indicate familiarity with each of the mods. This was used to determine task order. Players sorted each mod based on their frequency of use: Frequently, Sometimes, or Never. Mods in the “Sometimes” category were tested first, in order to allow the player some familiarity, followed by mods in the “Never” category.

Tasks for mods in the “Frequently” category were skipped because they would not provide useful observations.

JEI

All participants were already familiar with JEI, which is used to find information about items and crafting recipes added by other mods. Some tasks were designed to observe the player's use of JEI, but there are no tasks that explicitly require it.



JEI interface

Botania

The Botania mod contains an extensive, interactive guide book with information about game mechanics.

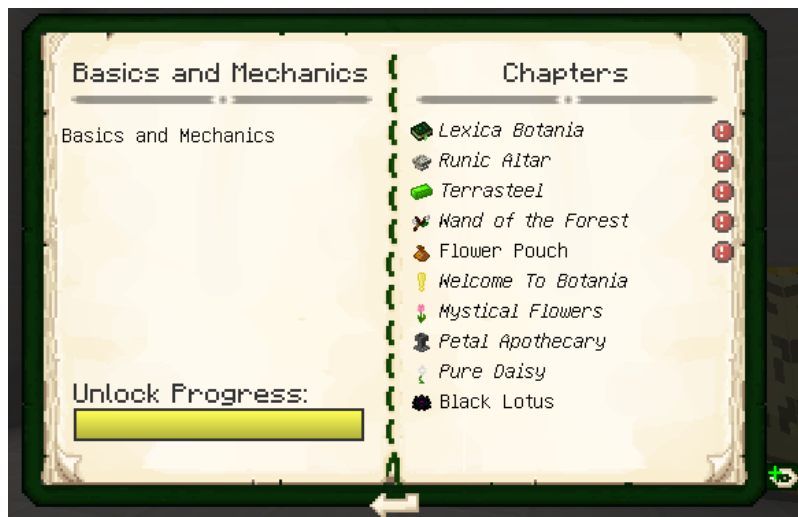
Task Instructions

A lectern in an otherwise empty room contained the instructions: "Craft a petal apothecary. Use the petal apothecary to create a Pure Daisy."

Expected outcome

To complete this task, it was expected that players would use some of the following resources:

- The Creative menu, to discover or obtain items from the mod
- JEI, to discover items or crafting recipes from the mod
- The Lexica Botania, an interactive guide book for the mod
- Internet search engines, to discover items or tutorials



The Lexica Botania

Actual outcome

Players primarily used JEI and the Lexica Botania to complete this task. Players did not use the Creative menu or the Internet. Most players completed the task in 3-4 minutes.

Use of JEI

Players used the “mod search” feature of JEI to locate items and recipes.

Use of the Lexica Botania

Most users opened the guide book to discover the solution. Some players spent 1-2 minutes using the guide book, other players became bored of reading after 10-15 seconds, and one user did not open the book at all.

Difficulties

Some players struggled to use the Petal Apothecary because it required water. Most players used the Lexica Botania to discover this. User 2 did not use the Lexica Botania, but added water successfully because “it looked like it should hold water” (User 2).

The last step of the task is to add a special ingredient to the water. Some players discovered the special ingredient before beginning the task, while reading about the Petal Apothecary. Other players discovered the ingredient as a tooltip that appears when viewing an incomplete recipe.

Analysis

Players used the “mod search” and “recipe search” features of JEI to facilitate this task. To complete the task, most players relied heavily on the guide book. User 4 stated, “Without that guide book I would be completely lost.” At the same time, players appreciated having the same information available in multiple places (regarding the special ingredient that was discovered either by reading the guide book or completing previous steps of the task).

Create

The Create mod is the most complicated mod in this study. The mod allows players to build machines using conveyor belts, motors, cogwheels, funnels, and more.

Task Instructions

Two non-adjacent chests were placed in a room and labeled “Chest A” and “Chest B.” Items were placed in Chest A. There was a lectern with the following instructions: “Use the Create mod to move all of the items in Chest A to Chest B.”

Expected outcome

To complete this task, it was expected that players would use some of the following resources:

- The Creative menu, to discover or obtain items from the mod
- JEI, to discover items or crafting recipes from the mod
- Ponder, a feature unique to the Create mod, which displays explanations and visual examples for all items in the mod
- Internet search engines, to discover items or tutorials

Specific solutions may involve:

- Placing conveyor belts, item funnels, item depots, or mechanical arms
- Pondering items in the mod



The Ponder menu

Actual outcome

Players primarily used JEI and the Ponder menu to complete this task. Players completed the task in 5-10 minutes.

Use of the Creative Menu and JEI

Players interchangeably used the Creative Menu and JEI to view items related to the task. Each item tooltip gave instructions on how to open the Ponder menu. Once the player located an item in JEI or the Creative menu, they were able to Ponder the item and its uses.

Use of the Ponder Menu

This feature is easily discoverable as a tooltip on every item in the mod. On average, players spent a total of 2-3 minutes using the Ponder menu.

The players had very positive feedback regarding the Ponder menu: “The ponder function is extremely useful. It has visual demonstrations, it links to other concepts...” (User 4). User 2 enjoyed how the Create mod seemed to “guide” them toward a solution.

For example, User 2 referenced the “Item Transportation” submenu to find solutions, and all of the users viewed the animated examples for one or more items.

Use of the Internet

At one point, a player opened the Internet to find instructions and noticed an image of a Mechanical Arm. The player then decided to close the online instructions and use the Ponder menu to learn how to use the Arm. Another player used the Internet to learn how to use a Funnel.

Difficulties

User 1 described their experience as “frustrating” because there was no guide book and they were forced to guess how to use the mod; the ponder feature was “definitely helpful” though.

Players who opted to use a Mechanical Arm usually failed to configure the arm the first time, but noticed a tooltip with configuration instructions that allowed the player to use the Arm successfully.

Several players attempted to place conveyor belts at an angle but were unsuccessful. The Create mod indicated failure using red particles. At this point, players usually opted for flat conveyor belts instead of further investigation.

Some players struggled to remove items from Chest A. One player opened a search engine to find the solution; other players found it in the Ponder menu. User 2 noted that the “sneak-click” interaction to use a funnel was not intuitive.

Analysis

Each player described the Ponder menu as the single most helpful aspect of their experience. JEI was used to locate mod items and open their individual ponder menus. Some players used the Internet for a small portion of the task.

Farming for Blockheads

This mod is very simple, but does not provide any instructions until players attempt to use a feature incorrectly.

Task Instructions

A lectern in an otherwise empty room contained the following instructions: “Use Farming for Blockheads to obtain 5 dark oak saplings.”

Expected outcome

To complete this task, it was expected that players would use some of the following resources:

- The Creative menu, to discover or obtain items from the mod
- JEI, to discover items from the mod
- Internet search engines, to discover items or tutorials
- The Market block GUI, which contains instructions on how to trade for saplings



The Market block GUI

Actual outcome

Players used JEI and the Creative menu to complete this task. Players completed the task in 1-2 minutes. All of the players chose to use the Market block and, upon opening the GUI, learned how to complete the task. Players did not use the Internet for this task.

Use of the Creative Menu and JEI

Players either used the mod search feature in JEI or the Creative menu tab to examine each item and determine if it can be used to complete the task.

Difficulties

Two players attempted to place the Market block against a wall, causing the Market Villager to suffocate. This is because there is no information about the Market Villager prior to placing the block.

All of the players attempted to use the Market block without the required items at first, because there is no information about how to use the Market before the first use.

Analysis

Players used either the Creative menu or the “mod search” feature in JEI to discover items in the mod. Players were able to learn game mechanics using visual cues and written instructions in a GUI. The mod did not provide instructions until the Market block was used incorrectly, which was a point of concern for some players but negligible to others.

Mekanism

The Mekanism mod uses specialized machines with GUIs that use icons and visual cues along with written tooltip instructions. Machines are interdependent and must be used with other machines from the mod.

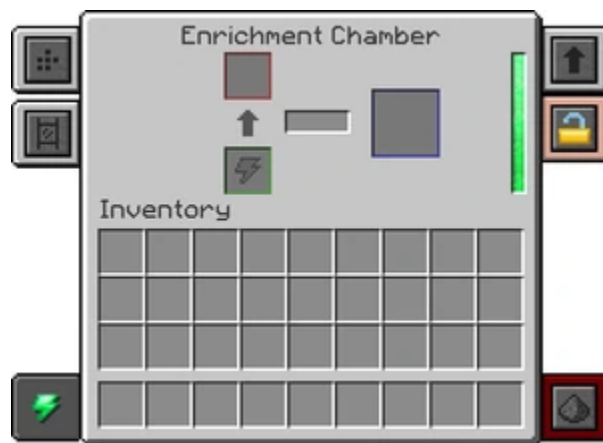
Task Instructions

A lectern contained the following instructions: “Use Mekanism to convert 1 iron ore into 2 iron ingots.” There was a chest nearby containing iron ore.

Expected outcome

To complete this task, it was expected that players would use some of the following resources:

- The Creative menu, to discover or obtain items from the mod
- JEI, to discover items from the mod
- Internet search engines, to discover items or tutorials
- The Machine GUI, which allows the player to configure a single machine. In order to use a machine, it must first be configured to set input, output, and energy sources.



Machine GUI

Actual outcome

Only two players were eligible for this task. Players primarily used JEI to locate the correct machines, then successfully used the Machine GUI to configure. Players did not use the Creative menu or the Internet. Players completed this task in 4-5 minutes.

Use of the Creative menu and JEI

Players used the “mod search” feature of JEI to discover items. When players encountered difficulties, they used JEI to find the correct machine for this task.

Use of the Machine GUI

Players used the Machine GUI to connect machines and supply power. They relied heavily on symbols in the GUI to know how to configure the machine.

Difficulties

Both players initially used the wrong machine. It is common practice among technology mods to crush ores into dust to complete this task; accordingly, both players tried to use a machine called the “Crusher.” Mekanism requires a different machine called the “Enrichment Chamber.” Players fixed their error by using JEI to find the correct recipe, which contained a reference to the correct machine.

Analysis

Players used the “mod search” and “recipe search” features of JEI to complete this task. Some players used the Machine GUI to configure settings. The solution required a machine with an un-intuitive name.

Switch-Bow

The Switch-Bow mod adds a bow, quiver, and arrows that have little to no documentation. The most complicated feature of the mod is the “switch arrow type” mechanic, which requires the user to perform an uncommon interaction.

Task Instructions

A crafting table and target were placed in the room. There was a lectern with the following instructions:

“1. Craft a Switch-Bow”

“2. Craft a Quiver and fill it with 3 different arrows. Remove all other arrows from your inventory.”

“3. Shoot each of the 3 arrows”

Expected outcome

To complete this task, it was expected that players would use some of the following resources:

- The Creative menu, to discover items from the mod
- JEI, to discover items and/or crafting recipes from the mod
- Internet search engines, to discover items or tutorials
- Right-clicking while holding the quiver to open it
- Scrolling the mouse wheel while crouched to change the selected arrow

Actual outcome

Players primarily used JEI and the Keybind menu to complete this task. The use of the keybinds menu was unanticipated but enlightening. Most players completed this task in 4-5 minutes.

Use of the Creative menu and JEI

Most players used the mod search feature of JEI to locate all items from this mod, then locate the required crafting recipes. Some players found this information through the Creative menu tab instead.

Use of the Keybinds menu

Task 3 required players to change their selected arrow type. Several players opened the Minecraft “Controls and Keybinds” menu to look for the hotkey that would allow the task to be completed. One user noticed that the default keybinds appear blank (this is a bug in the mod) and assigned their own keybinds.

Use of the Internet

One player used the Internet to search for instructions to complete the task, but stopped because of poor Internet connection. They later completed the task by investigating the Keybinds menu.

Difficulties

Some users were unsure how to fill the quiver, but tried holding the item and right-clicking as their first guess. One user attempted to fill the quiver using a crafting grid before finding the solution. Most users struggled to change their selected arrow type. The sneak-and-scroll interaction was described as very un-intuitive: “I would never have guessed that” (User 4). User 2 tried the interaction “by luck,” based on previous knowledge about sneak-and-scroll being used in some other mods. Controversially, User 3 described the interaction as “actually really intuitive” stating that they tried the interaction without thinking.

Analysis

Most players used the “mod search” feature in JEI to discover the items in the mod.

The sneak-and-scroll interaction required by this mod caused some difficulties. One player suggested that the interaction would be more clear if there was an item tooltip.

The keybinds menu was more helpful than previously expected. Players who are learning to use an unfamiliar mod may discover new features using the keybinds menu.

Timber Frames

A small mod that allows players to decorate some blocks using specific tools and interactions.

Description

A 4x4 pattern of blocks was placed on one side of the room and labeled “Original.” There was a lectern with the following instructions: “Use the Timber Frames mod to replicate the design.”

Expected outcome

To complete this task, it was expected that players would use some of the following resources:

- The Creative menu, to discover items from the mod
- JEI, to discover items and/or crafting recipes from the mod
- Internet search engines, to discover items or tutorials
- The Help menu GUI from the mod
- “Sneak-right-click” to configure the item used in this task



The Help menu

Actual outcome

Players used the Creative menu, JEI, and the Help menu to complete this task. Players did not use the Internet. Most players completed this task in 2-3 minutes.

Use of the Creative menu and JEI

Some of the players exclusively used the Creative menu to discover items. Other players used the “mod search” feature of JEI to discover items. Players who primarily used JEI completed the task more quickly.

Use of the Help menu

All of the players noticed a tooltip on one of the items that reads “Press H for Help.” Pressing H displayed the Help menu with instructions. Some players discovered the required interaction before opening the Help menu, but all of the players described it as a useful feature.

Difficulties

The instructions in the Help menu are incomplete. Several players struggled to find the last pattern required to complete the task before realizing they could combine patterns. The Help menu does not mention this feature.

Some players opened the Help menu more than once, possibly because they did not fully read the Help menu the first time, or to look for help with the aforementioned difficulty.

The Timber Frames mod does not have a dedicated Creative menu tab. Because of this, several players were unable to find the correct tools at first, and were only able to complete the task by manually searching for items from the mod.

The “sneak-right-click” interaction required to complete the task was described by one player as “Kind of clunky” (User 1).

Analysis

Players are better able to complete mod-specific tasks when all of the items from the mod can be seen in one place. Players can learn game mechanics by reading instructions but most players do not prefer to learn by reading.