Untangling the Challenges of Novice Minecraft Players: Navigating the Early Game without Tutorials

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Abstract
This case study delves into the experiences of five novice Minecraft players navigating the early game without instructions or tutorials. Through single 35-minute desktop gameplay sessions and post-session interviews, the study uncovers the challenges faced by players and their dependence on external assistance. Drawing from grounded theory analysis, the findings illuminate the hurdles novices encounter, particularly in understanding crafting mechanics and navigating the game world. These insights offer implications for tutorial design and game studies.

Author Keywords
Minecraft, tutorial, case study, think-alouds, qualitative analysis

Introduction
Minecraft, an open-world sandbox game with online multiplayer capabilities, offers players an expansive virtual environment where they can freely construct structures by connecting blocks representing various materials like dirt, stone, or glass. The game provides players with versatile gameplay options, including building, battling monsters, and crafting tools to enhance survival or aesthetic aspects of the world.

Minecraft's minimalist approach to tutorials and instructions aligns closely with our research objectives, allowing us to explore how individuals adapt and learn in unguided gaming environments. It prompts an investigation into the natural learning process of individuals new to the game and allows for the exploration of various aspects.

In this introduction, we want to outline the significance of our research within the context of Minecraft and its broader implications for other areas of study:

1.TRANSFERABLE INSIGHTS

Findings from this research can have broader applications beyond Minecraft. Insights into how users approach an unguided gaming environment may have implications for the design of other interactive systems, especially those with open-world and sandbox elements.

2. INFORMING TUTORIAL DESIGN

As tutorials and instructions play a crucial role in many games, understanding how novice players engage with Minecraft in the absence of such guidance can possibly lead to the design of more effective and engaging tutorials for other games.

3. ACADEMIC CONTRIBUTIONS

The study could contribute to the academic discourse on player behavior, learning processes, and interaction patterns in virtual environments. It adds to the body of knowledge in HCI, game studies, and educational technology.

In this paper, we studied 5 participants who have never played Minecraft or any other open-world sandbox game, and observed how they navigated through the game. By analyzing data extracted from their gameplay sessions, think-alouds, and interviews conducted at the end of each session, we gained valuable insights into the hurdles faced by novice players. Drawing from these insights, we formulated suggestions aimed at enhancing tutorials, particularly within the context of Minecraft and potentially other similar games in the future.

Case Descriptions

Here we will be providing a narrative description of each participant's experience with Minecraft in the sessions conducted, detailing their actions and decisions, challenges faced if possible their general opinions. We have a total of 5 participants, and for privacy concerns we have not disclosed their names.

Participant 1:

The first participant struggled the most compared to the other participants. This was because we did not provide them the basic controls, such as movement, breaking nor placing a block, so about 12 - 15 minutes of the session was spent on them figuring them out. The game does not provide any sort of instructional pop-up or notification that teaches the player these things, which serves to be a problem when the players undergo other activities. The participant started to slay sheep and practically any animal they came across. This ended up costing them at nighttime, as the 'mobs' in the game started chasing and slaying the player multiple times. The player then jumped into the ocean and started slaying fish, but didn't realize that the depleting air bubbles at the bottom of the screen indicated that they were about to start rapidly losing their health. It was around this time that the player decided to change gears and focus on crafting. But they didn't have

the slightest idea on how to do that. The game doesn't provide any instruction on how to craft objects, while only merely displaying a crafting square, which confused the player. This was where the researchers had to step in to help the participant craft a crafting table, which then led them to craft items of objectively no relevance in the beginning of the game.

During the interview, the participant was prompted to talk about the challenges they faced and their overall experience and enjoyment of the game. Upon being asked the question:

"Is there anything you wish you would've known before starting the game?"

They immediately responded by saying that they wish they would have been provided the controls prior to playing.

Participant 2:

The second participant started the game walking around the spawn area. They claimed that they wanted to 'get a feel' for the terrain, and get acclimated to the controls, which were provided to them and the remaining players subsequently as well. Like the previous player, they started to slay the surrounding farm animals. They ended up being slaughtered by the mobs, first by a zombie and then two skeletons. They then realized that crafting a weapon would be beneficial for these situations. The player faced the same problem with crafting the basic essentials, that being not knowing how to craft a crafting table and wooden planks, which could then be crafted into sticks and then into a sword. After crafting their weapon, they jumped into a water body and drowned, failing to understand how to stay afloat in the water or come back up to the surface. Following this, the player found a village and a ship , collecting resources from the chests scattered around these locations and crafted several more items after looting these chests.

During the interview, the participant said they appreciated the help the researchers provided to craft the basic items first, claiming that they would not have made any progress in the crafting area without any help.

Participant 3:

Player 3's run was probably the strangest out of the bunch. They took an ultra-aggressive approach, slaying anything in sight throughout the first half of the session, and vocalizing their intent to 'conquer their enemies'. Apart from crafting, which was a common struggle for each player, the player also had a lot of trouble navigating through the terrain they spawned in. The player was stuck in a water body, and struggled to leave it, as the game was designed in such a way that you would need to time your jump to escape the water and land on earth. After being taught the basic crafting mechanics, the player crafted a stone sword, with the intent of slaying more enemy mobs. The player stated that he wished the game had a clear final goal stated, and spoke of a video game series 'Prince of Persia' to illustrate his point. At the end of the session, the player stated "I feel like the day-time in the game gets over way too quick".

Participant 4:

Player 4's approach to the game was completely different to the others stated so far. They clearly emphasized their wish to craft a house from the get go. Upon spawning, the player collected an abundance of dirt blocks along with wooden log blocks to do so. The player, like the others struggled with the crafting process of creating

planks from the logs to craft the crafting table. The player also expressed the need for the game to prompt them to create 'essential items', being torches for lighting, planks for crafting the crafting table and other tools such as weapons. It started raining in within the game, and this sort of encouraged the player's desire to create a shelter. The player proceeded by creating the shelter in the form of a rectangular cuboid, along with the doors. To create torches, coal is required. This can be found in the form of an ore block. This information was given to the player by the researchers as it isn't provided in the game and the player had no other idea of what to do. They found themselves in water as well, struggling to stay afloat and leave it too.

Participant 5:

Player 5 started out wanting to mine materials. So, they dug a hole straight down into the earth at the spawn point. After they realized they wouldn't make much progress doing that, they were stuck trying to escape the hole, at first trying to break the stone blocks into a staircase structure. They figured out how to jump and simultaneously place a block underneath them to escape the hole afterward. There were a lot of similarities in this session in comparison to the other ones, such as slaying animals and struggling to craft. The player also struggled navigating and using the inventory interface, and felt it was overwhelming. The player also struggled to understand what were the essential items to craft first, which is something which could be observed in most of the other sessions, but here it was verbalized by the player themselves. They stated that the game doesn't provide any crafting progression, an important detail we made note of. The player liked the resemblance the game's terrain had to the real world. They wanted the game to incorporate a compass, as the world is large and they felt it would encourage them to explore more, as the compass would always point them back to their shelter (This exists in the game, but they weren't told that). Lastly, the player mined into a cliff and created a created a box-like shelter inside it before the timer ended.

Methodology

In this case study, we employed a grounded theory approach to analyze the qualitative data collected from gameplay sessions and participant interviews.

Data Collection:

Participant Selection: We recruited five participants who had never played Minecraft or any other open-world sandbox game before. This deliberate selection ensured a homogeneous sample of novice players, facilitating focused examination of their gameplay experiences.

Gameplay Sessions: During the gameplay sessions, participants were involved in multiple sessions, each lasting 35 minutes, and exclusively conducted on the desktop platform. Throughout these sessions, participants were encouraged to freely explore the game world without external tutorials and minimal intervention from researchers, only stepping in when participants felt unable to progress further. Observational data were collected by closely monitoring participants' actions and interactions within the game environment. The basic controls were provided to almost every participant except P1.[1]

[1]We did not realize how lost the player would be without providing the controls. However, while considering a sixth participant to counteract this error, we realized that after the fifth participant, we had reached a point of saturation, as the amount of new data that could be gained from a fresh session of 35 minutes would not add much value.

Think-Aloud Protocols: Participants engaged in think-aloud protocols, verbally articulating their thoughts and reactions as they navigated the game. These verbalizations provided valuable insights into participants' cognitive processes, decision-making strategies, and challenges encountered during gameplay.

Post-Session Interviews: Following each gameplay session, semi-structured interviews were conducted with participants to further explore their experiences and perspectives. The interviews focused on participants' enjoyment of the game, engagement with gameplay mechanics, difficulties encountered, and suggestions for improvement.

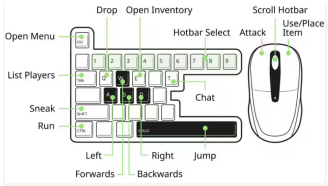

Figure 1: Official Controls retrieved from https://www.minecraft.net/en-us/article/minecraft-controls

Qualitative Analysis:

Having adopted the grounded theory approach, we started our analysis by first transcribing our recordings via Zoom and voice recordings (backup). The process is iterative; we regularly returned to earlier steps in the process, then followed the subsequent steps again from there.

Phase 1: Familiarization. During this initial phase, we immersed ourselves in the transcripts, becoming acquainted with the participants' discussions and interactions.

Phase 2: Open Coding. Here, we conducted open coding by systematically examining the transcripts to identify and label what we thought were interesting phenomena and common recurrences between each participant within the data. Through this process, we maintained reflexivity, continuously reflecting on our own biases and preconceptions to ensure the objectivity of the coding process. The researchers had varying levels of experience with the game; one with years of experience under their belt, one with a couple of months at best, and one with a couple of weeks. This helped us to code in a more objective manner.

Most of our coding revolved around the pain points of our players, but included some of the most common actions performed as well as a few interesting comments.

Phase 3: Development of Concepts and Categories. In this phase, the identified codes are further developed into broader concepts or themes. These concepts capture the essence of the codes and represent patterns or recurring elements in the data. The goal is to create meaningful categories that encapsulate the key ideas emerging from the analysis. Most of the categories and concepts lie in the crafting area, where many of the pain points of our participants were identified. The team met over the span of 3 days to finalize the concepts and categories.

Phase 4: Theory Formation. In this stage, we created inferential and predictive statements about the phenomena recorded in the data. More specifically, we develop explicit causal connections or correlations between the concepts and categories we identified after multiple iterations.

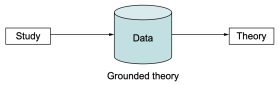

Figure 2: Grounded Theory Diagram - Lazar, J., Feng, J. H., Hochheiser, H. (2017). *Research Methods in Human Computer Interaction* (2nd ed.). Wiley.

Results

The open coding of the five sessions including the interviews resulted in 18 codes (see Table 1). These codes were compared and grouped together iteratively with each session. Codes and categories emerged around concepts such as the realism of the game, lack of prior knowledge and experience in the game, the game mechanics and the navigation struggles. Unfortunately, with merely 35 minutes to evaluate gameplay, it was difficult to distinguish gameplay styles, as almost every participant had really similar experiences. We were however, able to identify all of the common problems each participant had, and the parts of the game they especially enjoyed.

Adaptation to Survive: Novice players demonstrate adaptive behaviors in response to gameplay challenges and environmental stimuli. This suggests that novices exhibit a capacity for flexible adaptation, adjusting their gameplay strategies and decision-making processes based on immediate feedback and situational cues. Participant 3's shift from aggressive confrontation to problem-solving and crafting after encountering navigation difficulties (*Navigation: Tunnel Vision*) exemplifies this adaptive behavior. Furthermore, each participant responded to the increasing number of death from mobs by slaying animals for health, and crafting swords (*Survival: In Response to Mobs*). Hence, as novices confront obstacles and setbacks, they employ adaptive coping mechanisms to overcome challenges, fostering resilience and persistence in their gameplay endeavors.

Interviewer: How did your approach to playing the game change over time, if it did?

P4: *"I just wanted to build my house man, and with the mobs coming in the way while I was doing it, I crafted a sword to get rid of them quick."*

P5: *"I started the game mining things with my bare hands and killing animals. After I realized that I wasn't making any progress doing so, and with the mobs killing me , I shifted to crafting weapons and tools to mine and defend myself better."*

Navigation Complexity: Novice players in Minecraft encounter significant challenges in navigating aquatic environments due to the absence of in-game prompts or tutorials guiding them through water-related mechanics. The lack of clear instructions regarding essential concepts such as monitoring oxygen levels and mastering navigation controls exacerbates players' difficulties in traversing bodies of water effectively.

Additionally, the complexity of water navigation controls, compounded by the absence of in-game tutorials, presents a formidable obstacle for novice players. Without clear guidance on how to ascend to the surface or transition from water to land, players experience confusion and helplessness when navigating aquatic environments. The lack of intuitive controls for swimming and surfacing further impedes players' progress, leaded many participants to a state of helplessness that needed the intervention by the researcher. Moreover, the players also experienced tunnel vision in both land and aquatic regions, with the player dying in the game by panicking from the rapidly reducing health from oxygen depletion, or

Table 1: Codebook

Themes	*Sub-themes*	*Concepts*	*Code*
Navigation Complexity	Navigation	Inexperience	Basic Controls
	Navigation	Inexperience	Tunnel Vision
	Navigation	Water Navigation	Water Navigation Controls
	Navigation	Water Navigation	Water to Land Jump
Adaptation	Crafting	Inexperience	Progression of Crafting
	Crafting	Inexperience	Crafting the Crafting table
	Crafting	UI for Crafting	Crafting Square
	Crafting	Inventory	Placing Items into Inventory
	Survival	Not Knowing In-game Indicators	Attention to Water Bubbles
	Survival	In Response to Mobs	Slaying Animals for Food
	Survival	In Response to Mobs	Crafted Swords
Game Design	Game Mechanic	Not Knowing In-game Indicators	Meter for Block Breaking
	Game Mechanic	Not Knowing In-game Indicators	Durability of Tool
	Game Mechanic	Inventory	Surprise at Loss of Inventory
	Enjoyment	Inexperience	Daytime Preference over Nighttime
	Enjoyment	Realism	Liked the Daytime to Nighttime shift mechanic
	Enjoyment	Realism	Terrain Similarity

impeded movement. We observed this in almost every session where the participant tried climbing the walls of a hill or cliff. This can be chaulked up to a lack of experience (*Navigation : Inexperience*) playing the game, as it is normal to be flustered when you're stuck in a part of a game you've never played before.

Dependency on External Assistance: Novice players in Minecraft exhibit a dependency on external assistance to overcome gameplay challenges, particularly in situations where they encounter obstacles or lack essential knowledge. The absence of in-game tutorials or prompts to guide players through various game mechanics and scenarios contributes to players' reliance on researchers for assistance and guidance.

Participants expressed frustration and a sense of helplessness when confronted with unfamiliar situations or mechanics within the game. Without clear instructions or guidance provided by the game itself, players resorted to seeking assistance from interviewers to navigate challenges and progress in the game. This reliance on external intervention highlights the inadequacy of the game's tutorial system and its failure to adequately prepare novice players for independent gameplay.

Specifically, participants noted instances where they felt unable to make progress or overcome obstacles without the intervention of interviewers. For example, players

struggled to craft essential items or navigate hostile encounters with mobs without assistance, citing a lack of guidance or instruction within the game as the primary reason for their difficulty. The participants deferred to us for certain game mechanics (*Game Mechanic: Not Knowing In-game Indicators: Meter for Block Breaking*) & (*Game Mechanic: Not Knowing In-game Indicators: Durability of Tool*). P1 and P2 kept single-tapping the blocks in an attempt to break them, but to no avail. They assumed that the blocks were unbreakable, which they weren't. They were supposed to left click the block for a longer period of time. P5 was shocked when his pickaxe broke, and thought he couldn't craft any more of the same item, which isn't true. You can craft as many of the same item as you want, provided they fit in your inventory space.

P2: *"I wouldn't have known how to use the crafting table and navigate through its interface efficiently if you guys didn't help me."*

Discussion

In this study, we sought to explore the gameplay experiences of novice players in Minecraft, focusing on their interactions with game mechanics, navigation challenges, and the role of external assistance. Through qualitative analysis of gameplay sessions and post-session interviews, several key themes emerged, shedding light on the obstacles faced by novice players and their reliance on external support.

One notable finding of our study is the significant impact of time constraints on participants' ability to fully engage with the game and navigate its complexities. With each gameplay session limited to just 35 minutes, participants had limited opportunities to explore the game world, experiment with different mechanics, and adapt their gameplay strategies. This constraint may have hindered their ability to overcome challenges independently and fully immerse themselves in the game environment.

Furthermore, our findings highlight the pervasive dependency of novice players on external assistance, particularly in situations where they encountered obstacles or lacked essential knowledge. The absence of in-game tutorials or prompts guiding players through various game mechanics and scenarios exacerbated their reliance on interviewers for assistance and guidance. While this provides valuable insights into players' support needs, it may also reflect the limitations of the game's tutorial system rather than inherent player abilities.

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