

Design Evaluation Report - Testing -3

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Objective and Validation Metrics

Objective

The goal of this testing session was to see how easily users could interact with the new features of the **Extended Reality Video Workspace**, focusing on two main actions - placing videos in 3D space and trimming them by dragging.

I wanted to understand whether users could:

- **Grab and Place Videos:** Pick up floating video panels and place them anywhere in the XR environment while keeping them properly positioned after release.
- **Trim Videos by Dragging:** Grab one side of a video clip and move it left or right to shorten or extend it, just like trimming a clip in a traditional video editor.

Validation Metrics

| Action | Success Criteria | Measurement |
|------------------------|--|--|
| Grab and Place Video | The user can pick up a video panel and place it in a chosen location, and the video stays fixed without sliding or misalignment. | Verbal confirmation during think-aloud, task completion, observation of placement errors, and visible hesitation or confusion. |
| Trim Video by Dragging | The user can grab one side of the video and drag left or right to trim it, while the other side stays fixed. | Verbal confirmation during think-aloud, task completion, trimming direction errors, and visible confusion. |

Additional Metrics

- **Qualitative Feedback:** Participant comments gathered through think-aloud and short discussions after each task, giving insights into how intuitive or difficult each interaction felt.
- **Behavioral Observations:** Notes on hesitation, repeated attempts, or unintended actions to help identify usability issues.

Results

Task Completion Summary

| Interaction | Success Rate | Common Observations |
|-----------------------|---------------------------------|--|
| Grab and Place Videos | 5 / 6 participants successfully | Some participants initially struggled to identify which videos |

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|------------------------|---|---|
| | grabbed and placed the floating videos. | were interactive, as there were no visible affordances. Most could grab and place them, but a few noticed that videos occasionally rotated or aligned at odd angles when released. |
| Trim Video by Dragging | 2 / 6 participants completed the trimming task correctly. | Most participants did not understand how to trim the video until it was demonstrated. A few confused trimming with slicing or resizing. Some were unsure which side to hold first, and others found the interaction jumpy or unstable. The trimming worked more smoothly when hand interactions were used instead of controllers. |

Observed Actions

- Several participants tried interacting with random objects before finding the floating videos, suggesting a need for stronger visual cues.
- While placing videos, users often adjusted their position or rotation multiple times to align them properly.
- During trimming, many attempted to grab both sides of the video at once, while others tried expanding instead of shortening.
- Some participants experimented repeatedly after seeing movement, trying to understand whether they were trimming or moving the entire clip.
- A few participants commented that the trimming felt inconsistent or too sensitive to small hand movements.

Participant Comments (from Think-Aloud and Feedback)

On Grabbing and Placement:

- “I wasn’t sure which one I was supposed to grab at first.”
- “When I placed it, it sometimes rotated weirdly.”
- “It would be nice if it snapped flat when I dropped it.”

On Trimming Interaction:

- “At first, I thought this was supposed to cut the video.”
- “I didn’t know which side to hold to make it shorter.”
- “When I used my hand, it felt smoother than with the controller.”

Analysis/Insights

| Theme / Observation | Evidence / Pattern | Interpretation / Insight | Design Implication |
|------------------------|---|--|--|
| Grabbing and Placement | Most users could place videos but were unsure which were interactive; | Users need stronger cues to know what can be grabbed and clearer | Add hover glow cues and snapping alignment to keep videos straight |

| | | | |
|----------------------|---|---|---|
| | some rotated oddly when released. | placement control. | when placed. |
| Trimming Interaction | Only 2 of 6 trimmed correctly; most confused trimming with slicing or didn't know which side to grab. | Trimming wasn't intuitive, handles and direction feedback were unclear. | Add visible trim handles, edge highlights, and feedback when trimming starts. |
| Behavioral Patterns | Users hovered and experimented repeatedly, showing curiosity but also confusion. | Lack of clear feedback led to trial-and-error behavior. | Improve feedback, highlight grab areas, show active edges, and add brief hints. |

Evaluation of Aims

Grab & Place Videos:

Partially achieved. Most users could grab and place videos correctly, but some weren't sure where to hold. The interaction itself works, but it needs clearer grab indicators and better control when placing.

Trim Interaction:

Not achieved. Only a couple of participants managed to trim without help. Most weren't sure how to start or which side to drag, confusing trimming with resizing. This shows trimming needs clearer visual handles and feedback.

Overall Usability:

Partially achieved. The XR space was engaging but limited by the lack of movement and snapping feedback. Participants enjoyed the idea but wanted smoother control and a more natural editing feel.

Concept Iteration

1. Grab Interaction

Some users struggled to find where to grab the video. To fix this, small grab handles will be added on both sides, with a slight glow when hovered, making the interaction easier to spot and use.

2. Trimming Design

Trimming will be simplified with clear handles on each edge. When grabbed, the edge will glow, and a guide line will show the trim range, helping users understand how much they're cutting.

3. Visual Feedback

Visual feedback like arrows for trimming and light flashes when videos are placed correctly will make interactions clearer.

4. Snapping Alignment

A snap feature will make videos automatically align when near the editing panel, reducing placement errors and giving a smoother editing experience.

Reflection

Prototype Session Review

Across the three prototypes, the project gradually evolved from simple floating video interactions to a more advanced XR editing experience. In the first version, I explored basic actions like grabbing, hovering, and trimming. The second prototype introduced timeline-based editing and visual affordances, improving clarity and usability. By the final prototype, the focus shifted to trimming and placement, testing whether users could perform these actions naturally.

During testing, participants appreciated the immersive setup and concept of editing in 3D, but many found it difficult to identify where to grab or how to trim without guidance. The experience proved engaging overall, but the feedback highlighted the need for clearer visual and functional cues to support intuitive learning within the XR space.

Methodological Reflection

Using **task-based usability testing** with **think-aloud feedback** provided a balanced understanding of both user behavior and thought processes. It helped me identify where users hesitated or became confused and why certain actions were misunderstood.

Early tests mainly measured success and failure, but in later sessions, I started noting behavioral details, such as hesitation or repeated actions, which revealed much richer insights. In future testing, I'd like to include motion tracking or controller data to measure efficiency more precisely and combine it with user feedback for stronger evidence of usability improvements.

Concept Evaluation

The XR Video Workspace successfully demonstrates how spatial editing can make video manipulation more immersive. The core functions- grabbing, trimming, and placing videos- worked as intended, but not always in a way that felt natural for first-time users.

Most participants understood the purpose of the environment, yet struggled with knowing where to grab or how trimming worked. These issues point to the importance of clearer affordances, consistent visual feedback, and smoother responsiveness. Despite that, the concept proved strong: users saw the potential of editing in XR once they understood the interactions, confirming the design direction is promising but still needs refinement.

Improvements and Extensions

Next, I plan to refine interactivity and feedback. Adding clear grab handles and hover glows will make it easier for users to identify interactive areas. The trimming system will include visual edge handles and haptic or visual feedback to show precision. A snapping feature will also help videos align automatically to the timeline, improving workflow.

Finally, adding simple movement controls will make the experience feel more immersive and natural. Looking ahead, I can see this concept growing into a collaborative XR editing workspace, where multiple users can edit and align clips together in real time.

Appendix

Table 1: Task Completion Rates

| Task | Participant 1 | Participant 2 | Participant 3 | Participant 4 | Participant 5 | Participant 6 | Completion Rate(%) |
|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------------|
| Grab and Place Videos | Completed | Completed | Completed | Completed | Completed | Not Completed | 83% |
| Trim Video by Dragging | Not Completed | Completed | Not Completed | Completed | Not Completed | Not Completed | 33% |

Table 2: User Errors

| Task | Participant 1 | Participant 2 | Participant 3 | Participant 4 | Participant 5 | Participant 6 |
|------------------------|---------------------------------------|--------------------------------|---------------------------|-----------------------|-------------------------------|---|
| Grab and Place Videos | Tried grabbing from center, not edges | Worked correctly | Placed at odd angle | Worked correctly | Dropped before placing | Failed to grab video |
| Trim Video by Dragging | Didn't understand trimming | Confused trimming with slicing | Didn't know where to grab | Worked after guidance | Trimming action too sensitive | Couldn't interact with the video at first |

ACKNOWLEDGMENT OF AI

I have used Open AI's Chatgpt (www.chatgpt.com) to fix grammatical errors and replace a few words with their synonyms in the content.