Evaluation 1

**Objective and validation metrics:**

State what you aimed to test and how you defined success. Detail the criteria you used to judge whether your goals were met.

Objective 1 : Viewpoint Adjustments   
 Metric:  Users were observed adjusting their viewpoint and successfully moving around the interface without any external help

Objective 2 : Object Manipulations   
 Metric: participants were able to pick up the cube by pointing with the mouse, holding the right click to rotate it, and left-clicking to drop it.

Objective 3 : Intuitive Interface and Shortlisting  
 Metric: If participants understood that shortlisting occurs by approaching an item and activating a button icon when close. If participants understands whether color changes on materials indicated shortlisting or just selection. It shows weather users benefit from clearer feedback mechanisms, such as a confirmation window or more explicit iconography

**Results:**

Here are the **key findings** from your prototype testing session, summarizing what participants did, said, and experienced during each objective, presented factually and concisely:

**Viewpoint Adjustments**

* All participants successfully moved around the interface without external assistance, though some required initial guidance to regain the pointer using the ESC key.
* Most participants found navigation intuitive once familiar with the controls.

**Object Manipulations**

* Participants consistently picked up cubes by pointing with the mouse. Right-click was used to rotate and left-click to drop objects, as instructed by the UI prompts.
* A few found rotation confusing at first and attempted to rotate as they would in a real-world setting before adapting to the controls.
* Visual feedback, like color changes or prompts, aided in understanding object interactions for most testers.

**Intuitive Interface and Shortlisting**

* Participants used proximity and button icons to initiate shortlisting. The color change of objects when approached signaled interactivity for many.
* Some confusion existed about the meaning of “shortlist.” Several participants misunderstood its function or thought similar UI screens meant materials were the same.
* The proximity highlighter and visual cues improved clarity, and most participants responded positively after initial exposure.

**UI and Lighting Controls**

* When the proximity highlighter was enabled, participants used it to identify selectable objects and found it helpful.
* For lighting controls, most participants assumed toggling would affect only the selected or closest object, but the global toggle surprised some.
* Static buttons made some participants expect individual item control rather than global actions.

**Participant Observations**

* **Participant 1:** Needed ESC key for pointer; quickly learned interactions; confused by “shortlist,” assumed similar UI meant identical materials.
* **Participant 2:** Found navigation easy; interpreted yellow color as shortlist; transparency effect aided exploration; confused by global light toggle.
* **Participant 3:** Initially confused by movement and interactions; liked proximity area UI; suggested color gradients for proximity; understood global lighting control.
* **Participant 4:** Adapted quickly to movement; struggled with rotation; benefited from proximity color change; connected UI similarity to material similarity.
* **Participant 5:** Interested in exploring; struggled initially with rotation; appreciated proximity feedback; recommended better labeling for shortlist; expected individual lighting controls; suggested onboarding guidance.

These findings document the factual behaviors, comments, and experiences of participants during the testing session.

**Analysis/Insights:**

The testing results reveal several key insights about the concept’s usability and how users interact with it, highlighting both strengths and areas for improvement.

**User Adaptation and Learning Curve**

Participants generally adapted well to navigating the virtual environment once initial instructions or cues (like using the ESC key to regain the pointer) were understood. This suggests the prototype has a manageable learning curve but benefits from clearer onboarding or guidance to support first-time users.

**Object Manipulation Usability**

Most users successfully picked up, rotated, and dropped objects using the mouse controls, showing that the interaction design is largely effective. However, some users initially applied real-world expectations to rotations, indicating a need for clearer signals or tutorials to bridge the virtual-real interaction gap.

**Importance of Visual Feedback**

Visual cues such as the proximity highlighter and color changes greatly helped users identify interactive objects and understand the system state. Users responded positively to these feedback mechanisms, showing their importance in enhancing intuitiveness and reducing confusion.

**Ambiguity around Shortlisting Concept**

There was noticeable confusion around the shortlisting feature. Many users did not fully grasp what “shortlist” meant or how it differed from selection, sometimes assuming materials with similar UI were identical. This points to a need for clearer terminology, more explicit feedback, or onboarding to better communicate this feature’s purpose.

**UI Design and Expectations**

The placement and behavior of UI elements affected user expectations. For example, a static lighting toggle button led some users to expect item-specific control, but the global effect surprised them. This suggests that UI design should be more consistent with user mental models or better communicate its function to avoid confusion.

**Variation in User Mental Models**

Differences in how users expected to interact—such as dragging items versus proximity selection or controlling individual lights—highlight diverse mental models. This indicates the value of flexible or customizable interaction options and the importance of usability testing to uncover such variations.

In summary, the findings show that the core interaction design is functional and adaptable for users but requires refined onboarding, more intuitive UI feedback, and clearer communication of key features like shortlisting to improve overall usability and user satisfaction. These insights guide targeted improvements to align the virtual experience more closely with user expectations and mental models.

**Evaluation of Aims:**

**Validated Objectives**

* **Viewpoint Adjustments:** This objective was well validated. Participants were generally able to move around and adjust their viewpoint independently after minimal guidance, confirming the prototype’s effective navigation design.
* **Object Manipulations:** Largely validated, as most users could pick up, rotate, and drop objects using the mouse controls as intended. The visual cues and interaction methods supported successful manipulation for the majority.

**Partially Validated or Uncertain Objectives**

* **Intuitive Interface and Shortlisting:** This objective showed mixed results. While participants could use proximity cues and button icons to engage with shortlisting, understanding of the concept itself was unclear or inconsistent. Users’ confusion about what “shortlist” meant and the similarity of UI screens for different materials indicates this objective is only partially validated.
* The effectiveness of the color change as feedback was somewhat uncertain, as some users misunderstood its meaning (selection vs. shortlisting), suggesting that further validation and UI refinement are needed.

**Aspects Left Uncertain or Needing Further Testing**

* The global versus item-specific behavior of lighting controls led to user surprises and expectations mismatches, which was outside the original objectives but revealed an important usability concern. Further testing with clearer UI designs could clarify this.
* Participants’ varying mental models for interaction, such as how to shortlist or manipulate items, suggest that additional research or testing is needed to accommodate different user expectations.

**Concept Iteration:**

Based on the evaluation insights, here are specific design changes and affirmations for the next iteration of the prototype, showing clear responses to the identified issues:

**Onboarding and Guidance Enhancements**

* **Add a brief, interactive tutorial** at the start explaining basic navigation controls (e.g., using ESC to regain pointer) and object interactions (pick up, rotate, drop).
* **Use contextual tooltips or hints** during initial interactions to reduce early confusion and speed up user adaptation.

*Response:* This addresses the learning curve users experienced and ensures smoother first-time use.

**Clearer Shortlisting Communication**

* **Rename “shortlist” to a more intuitive term** such as “favorites” or “saved items” to reduce confusion about its purpose.
* **Implement explicit visual feedback** for shortlisting, such as a confirmation pop-up or distinct icon change when an item is shortlisted.
* **Differentiate shortlist UI screens** with clearer labels or color variations to avoid assumptions that similar UI means identical materials.

*Response:* These changes directly respond to users’ misunderstanding and inconsistent mental models around shortlisting and improve clarity.

**Refined Visual Feedback**

* **Use distinct color gradients or patterns** to represent different proximity levels rather than just a single color change.
* **Maintain the proximity highlighter** as a key visual aid during interactions, given its positive reception.

*Response:* This improves users’ ability to interpret spatial and interaction cues more accurately.

**Lighting Control UI Improvements**

* **Separate global and individual lighting controls** clearly in the UI or add toggles to switch modes.
* **Provide explicit labels or descriptions** for lighting buttons to clarify their scope of effect.

*Response:* This resolves user confusion about the lighting toggle’s effect and aligns UI behavior with user expectations.

**Affirmations on Effective Elements**

* Continue using **mouse-based object manipulation with right-click rotation and left-click drop**, as most users adapted well.
* Retain **proximity-triggered UI elements** for shortlisting, which supported natural interaction flow.

These targeted design updates respond directly to validation outcomes, aiming to enhance usability, reduce confusion, and align the virtual experience more closely with user mental models and expectations. Subsequent testing can confirm their effectiveness.

**Reflection on the concept/design/methodologies/future testing and planning:**

**What Worked Well**

* The **structured objectives and validation metrics** focused the testing on key interactions, enabling clear assessment of usability aspects like viewpoint adjustment and object manipulation.
* Use of **A/B testing with proximity highlighter toggling** effectively explored user perception of spatial cues and UI responsiveness.
* Gathering detailed **participant observations** enabled a nuanced understanding of user behaviors and mental models, enriching the analysis beyond just task completion rates.

**What Did Not Work as Well**

* Some **objectives and metrics lacked precise quantification**, leading to partial validation and some uncertainty about success criteria, especially around the shortlisting concept.
* The **onboarding and initial user guidance** was insufficient, causing some users to struggle with basic controls early on and potentially impacting their overall experience and feedback.
* The **terminology and UI feedback for shortlisting** were ambiguous, resulting in confusion that could have been mitigated with clearer communication strategies prior to testing.