

# Star River Notes – Test Plan 3

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## 1. Background

This third usability test focuses on verifying the newly added interaction modes and onboarding system in Star River Notes 3.0. The previous evaluation (Iteration 2) identified key usability issues such as the absence of in-app guidance, unclear interaction mapping, and a node-generation bug causing planets to spawn below ground level. The SUS average score in Iteration 2 was 55/100, indicating that further refinement was needed. This test aims to validate whether the implemented improvements—gesture controls, tutorial overlay, visual feedback, and cinematic video projection—enhance usability, intuitiveness, and overall user satisfaction.

## 2. Objectives and Hypotheses

Objectives:

- O1: Evaluate the effectiveness of the new tutorial system in helping users quickly understand controls.
- O2: Assess intuitiveness and comfort of partial gesture-based operations.
- O3: Verify the usability and visual clarity of the new video projection (cinema-screen style).
- O4: Evaluate whether hover outlines improve selection accuracy and visual clarity.

Hypotheses:

- H1: The tutorial system reduces confusion during first-time use and increases task completion rate.
- H2: Gesture interaction improves immersion and perceived intuitiveness compared to purely button-based control.
- H3: The cinematic video view enhances spatial focus and reduces clutter.
- H4: Hover outlines reduce selection errors.

## 3. Prototype Description

The Star River Notes 3.0 prototype builds upon the previous iteration with the following new features:

1. Partial gesture-based controls – users can now use hand gestures to move or rearrange planets.
2. Tutorial system – accessible via the left-hand controller menu button, offering step-by-

step onboarding.

3. Video projection redesign – videos now appear as distant cinematic screens for better immersion and visibility.

4. Hover outline – when the cursor hovers over a planet, it displays a glowing edge to indicate focus.

#### **4. Participants**

- Target Group: Design and computing students familiar with VR environments.
- Sample Size: 5–10 participants.
- Recruitment: Voluntary sign-up during class.

#### **5. Methodology**

Testing will employ a mixed-method approach combining Think-Aloud Protocol, SUS questionnaire, and task-based observation.

- Method 1: Think-Aloud Protocol – participants verbalize thoughts during interactions.
- Method 2: SUS Questionnaire – post-test survey to assess overall usability perception (1–5 Likert scale).

#### **6. Test Tasks**

Throughout all tasks, participants will be asked to think aloud—that is, to continuously express their thoughts, expectations, and confusion while interacting with the system. Each task aims to capture user performance and reasoning processes, helping identify how users understand the interface and system logic.

Task 1 – Discover and use the tutorial

Task 2 – Create multiple nodes and connect them

Task 3 – Store content within nodes

Task 4 – Watch the video

Task 5 – Store Screenshots Within Nodes

Task 6 – Drag Nodes, Observe Hover Outlines and Visual Feedback

Task 7 – Attempt Gesture-Based Node Dragging

- Objective Data: Task completion rate without prompts, time spent per task.

- Subjective Data: SUS questionnaire (10 items), comments from verbal thinking recordings.

## 7. Success Criteria

- SC1: Tutorial Access: The participant can find and open the tutorial without external help.
- SC2: Task Completion: The participant can finish all core tasks (create, link, store, play video) with minimal hesitation.
- SC3: Gesture Interaction: The participant can drag planets using gesture control and feels it is natural.(Y/N)
- SC4: Visual Feedback: The participant notices the hover outline and cinematic video projection and comments that they are clear or helpful.(Y/N)
- SC5: Overall Impression: The participant reports the experience as understandable and comfortable (SUS score).

## 8. Procedure

- Step 1 – Introduction (1 min): Explain test purpose; obtain consent.
- Step 2 – Tutorial Discovery (1 min): Observe how users find and use the tutorial.
- Step 3 – Task Execution (6–8 min): Perform thinking aloud.
- Step 4 – SUS Questionnaire (2 min): Collect subjective ratings.
- Step 5 – Debrief Interview (2 min): Discuss likes, confusions, and suggestions.

## 9. Reflection and Expected Outcomes

This testing plan is grounded in established research on usability, feedback, and interaction design in immersive environments.

Bowman et al. (2002) highlight the importance of **direct manipulation and consistency** in 3D user interfaces, showing that clear spatial feedback helps users maintain orientation and confidence during complex spatial interactions. This directly supports the inclusion of gesture-based planet manipulation and hover outlines in Star River Notes 3.0.

Brooke's (1996) *System Usability Scale (SUS)* provides a validated and efficient metric for assessing perceived usability even with small participant samples, aligning with the evaluation method adopted in this plan.

Norman (2013) emphasizes that effective design depends on **visibility, feedback, and mapping**, principles reflected in the tutorial overlay and hover outline feedback implemented in the prototype.

McMahan (2011) explores how higher-fidelity display and interaction systems increase user presence and engagement in virtual reality, supporting the design choice of **cinematic-style video projection** for immersive viewing.

Finally, Sanchez-Vives and Slater (2005) discuss how immersive experiences enhance both cognitive focus and emotional involvement, reinforcing the central aim of Star River Notes—to foster meaningful engagement and comprehension through spatial interaction.

Collectively, these works validate the methodological and design choices within this testing plan, demonstrating that the evaluation of onboarding clarity, gesture intuitiveness, and visual feedback aligns with well-established theories in human-centered and immersive design.

## 10. References

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