

Tiktaalik Locomotion | User Testing Findings Report

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Overview & Methodology

This user research focused on comparing two different educational formats for presenting information about a significant prehistoric creature: a linear video animation and an interactive prototype.

Ten 30-minute online usability testing sessions were conducted in February 2025 with participants recruited through UserInterviews.com. Participants were split into two groups: one group viewed the video animation of Tiktaalik, while the other group interacted with a prototype. We conducted sessions using Zoom, with participants sharing their screens when exploring the prototype or watching the video.

Participants were asked to introduce themselves, asked permission to record the session, and then shown either the video or prototype. While watching the video or exploring the prototype, they were encouraged to think aloud, provide feedback, and ask questions.

Throughout each session, we learned about engagement patterns, content comprehension, and the users' expectations for each format. Additionally, interview questions focused on learning goals and key takeaways about Tiktaalik and its evolutionary significance.

This document serves as a high-level summary of our findings; the findings here capture feedback and sentiments where we saw patterns across the groups of participants.

Participant Profiles

Participant Summary

The participants for this User Test were sourced from UserInterviews.com.

Participants were screened to match target audiences: adults with diverse backgrounds who visit museums at least occasionally. Age, income, gender, and familial diversity further informed participant selection.

Screening Survey

ID	Name	Location	Age	Parent?	Museum Visitor?	Educational Media
P1	Pedro	Columbus, OH	29	✗	✓	YouTube, Reddit, AI tools
P2	Qingzhao	Londonderry, NH	31	✗	✓	Red Note, YouTube
P3	Jonah	Winston-Salem, NC	32	✗	✓	Reddit, Instagram
P4	Glenn	Los Angeles, CA	37	✓	✓	Various
P5	Felicia	Newton, NJ	38	✓	✓	TikTok
P6	Stephanie	Dayton, OH	39	✓	✓	Various
P7	Chris	Rancho Mission Viejo, CA	43	✓	✓	None
P8	Jamie	Farmington, CT	43	✓	✓	YouTube, PBS Kids

P9	Jeni	Fayetteville, GA	50	✓	✓	YouTube
P10	Denise	Atlanta, GA	61	✓	✓	Instagram

Findings

Our testing revealed significant differences in how participants engaged with and understood content between the linear video animation and interactive prototype formats. Overall, the video animation proved more effective at conveying the key educational messages about Tiktaalik and its evolutionary significance. The prototype facilitated a more didactic lesson in specific anatomical features, but participants lacked understanding of the key takeaways.

Both formats had their strengths and weaknesses, suggesting that an ideal approach might incorporate elements of both. Most participants reported learning something new regardless of which format they experienced, indicating that both approaches have educational value.

Key Observations

Video Animation Advantages:

- Better demonstrated the creature's **movement and transition between environments**
 - 5 out of 5 video participants specifically mentioned movement as a key takeaway, compared to 2 out of 5 prototype participants.
- Created a more cohesive understanding of **the relationship between fossil and living creature**
 - 4 out of 5 video participants mentioned the clear connection between the fossil and animated creature, while several prototype users expressed confusion about the relationship.
- Engaged participants more effectively through **multimodal presentation** (visual, audio, motion)
 - Most video participants praised the combination of audio and narrated content, however several expressed desire for more on-screen text.

Interactive Prototype Advantages:

- Let users **control their own pace** and revisit information
 - 3 out of 5 prototype participants expressed appreciation for the self-paced exploration, while at least 2 of the video participants specifically mentioned the desire for more control over playback.
- Allowed for more **nuanced exploration of specific features**
 - 4 out of 5 prototype participants mentioned specific anatomical features in their key takeaways (however, spiracle in particular were a regular point of confusion)

Engagement and Learning

Participants across both formats reported learning new information about Tiktaalik, but the nature of what they learned differed significantly. Learning goals and key takeaways are measured using the following knowledge hierarchy:

Level	Knowledge Hierarchy
0	I don't know anything about Tiktaalik and I don't care.
1	I don't know anything about Tiktaalik, but I am curious and/or interested and would like to know more.
2	I understand that Tiktaalik existed.
3	I understand how Tiktaalik moved from water to land.
4	I understand what anatomical features let Tiktaalik move that way.
5	I understand that Tiktaalik represents a turning point in vertebrate locomotion.
6	I understand that the fossil record and paleontological reconstructions let us guess how ancient creatures moved.

Participant Knowledge Hierarchy Scoring

ID	Type	Start	End	Growth	Notes
Jamie	Video	1	6	5	Understood Tiktaalik's role in evolution, appreciated the transition visualization from fossil to creature
Glenn	Video	1	6	5	Recognized the transitional nature, understood how it moved between environments
Denise	Video	1	5	4	Described it as "a link between past and present," understood the movement and evolutionary significance
Felicia	Video	1	4	3	Impressed by ability to live in both environments, focused on adaptations, appreciated seeing bone structure
Jeni	Video	1	5	4	Described it as "intermediary in the evolutionary process," recognized adaptations similar to land animals
Jonah	Prototype	1	4	3	Focused on anatomical details like legs, described it as "amphibious," but lacked deeper evolutionary context
Qingzhao	Prototype	1	4	3	Understood how anatomy affects movement and breathing, but primarily focused on mechanical aspects
Chris	Prototype	0	2	2	Recalled basic anatomical features but couldn't articulate evolutionary significance
Stephanie	Prototype	1	4	3	Described basic land/water capability, recognized flat head adaptation, but limited evolutionary context
Pedro	Prototype	1	5	4	Recognized it as "first to really migrate from water to land" but didn't elaborate on significance

Average Video Growth: 4.2 levels

Average Prototype Growth: 3.0 levels

The knowledge hierarchy scores demonstrate that participants who viewed the linear video showed greater knowledge growth compared to those who interacted with the prototype.

Video participants achieved an average growth of 4.2 levels on the knowledge hierarchy scale, with some reaching the highest levels (5-6) of understanding. These

participants generally grasped the evolutionary significance of Tiktaalik and its role as a transitional species, not just its anatomical features. Prototype participants showed more modest growth, averaging 3.0 levels (this is still significant and successful growth).

Interestingly, there appears to be a pattern in how participants progressed through the knowledge hierarchy. Video participants often "skipped" level 4 (understanding specific anatomical features) but still reached higher conceptual understanding. Meanwhile, prototype participants who missed level 3 (how Tiktaalik moved from water to land) tended to get stuck at level 4, focusing on anatomical details without connecting to the broader evolutionary context. This suggests the linear video format may be more effective at conveying the "big picture" conceptual understanding, while the interactive prototype excelled at conveying specific anatomical information but sometimes failed to connect these details to their evolutionary significance.

Link to Knowledge Hierarchy Scoring Table: [📄 Locomotion Knowledge Hierarchy](#)

Accessibility and Usability

Both formats presented different accessibility and usability considerations:

Linear Video:

- Speed was an issue for some older viewers who wanted more time to process information
- Some participants wanted subtitles for better comprehension
- Several participants expressed desire for playback controls to pause or rewatch sections
- Some wanted the ability to see different angles of the creature

Interactive Prototype:

- All users were able to navigate the prototype to completion without assistance
- Several users confused the highlighted features as interactive hotspots
- Some users expected to be able to manipulate the 3D model and view it from different angles

- Participants wanted a clearer connection between the fossil and the animated creature

Recommendations

Based on our findings, we recommend pursuing a hybrid approach that combines the strengths of both formats.

General Improvements

- 1. Combine multimodal presentation with interactive elements**
 - Create a video-based experience that includes interactive pause points
 - i. These “pause points” may allow users to rotate, highlight, or read more about specific features
 - Maintain narrative connection between audio, visual, and text content for an inclusive and engaging experience
- 2. Clarify the evolutionary significance**
 - Emphasize Tiktaalik's role as a transitional species in all formats
 - Explicitly connect anatomical features to evolutionary advantages
 - Maintain focus on the "big picture" even when highlighting specific features
- 3. Enhance connection between fossil and animation**
 - Consider adding a overlay views that shows the relationship between fossil and animated creature
 - Consider adding an intermediary animated skeleton layer to emphasize how paleontologists can reconstruct how ancient animals moved by looking at the fossil record
- 4. Support different learning styles through inclusive design**
 - Include options for different pacing (speed controls)
 - Provide text alternatives to audio content (subtitles/captions)
 - Allow for both guided and self-directed exploration

Video Format Improvements

1. Add interactive controls
2. Enhance visual presentation with more angles, animations, and overlays

3. Improve accessibility with captions and speed control

Interactive Prototype Improvements

1. Emphasize the connection between the fossil and the animated creature
2. Enhance interactive elements by allowing fossil and animated model rotation

Appendix A: Testing Materials

Video Animation

- Format: 1:12 minute video
- https://drive.google.com/file/d/1FyCm4ApE2RW6hWxz_nkt8OnWzZgpKqfz/view?usp=drive_link

Interactive Prototype

- Format: Figma prototype
- <https://www.figma.com/proto/Q8VzBxmSkojynd1bL5mwPY/AV103.9-Locon?page-id=1270%3A39&node-id=2990-958&viewport=316%2C359%2C0.04&t=q1UHTezFASOuWhsC-1&scaling=contain&content-scaling=fixed&starting-point-node-id=2990%3A958>

Supporting Documentation

-  Locomotion Interview (data from interviews)
-  Tiktaalik Interviewer Guide (interview script)