Construct-A-Saurus

This section discusses the evaluation of the interactive exhibit, construct-a-saurus, using usability inspection and ethnography.

Usability Inspection:

Content

The game involves building a dinosaur in five phases – head, torso, fore limbs, hind limbs, and tail. The essence is to teach players how body mechanics are employed in the survival of an animal. Six types of dinosaurs are used to reinforce/test the learnings from the fossils and other exhibits in the gallery-tyrannosaurus (giant carnivore), triceratops (large carnivore), bambiraptor (small carnivore), gorgasaurus (large carnivore), hypacrosaurus (large herbivore), and leptoceratops (small herbivore). However, the gallery exhibits do not include the fossils or information about leptoceratops. Instead, fossils of prenoceratops which is also a small herbivore are on display.

Introduction Text:

> *Use the lab to construct a dino. Unleash it into the wild and head it home.*
> *If you do not understand the controls, click the help button.*
> *Click anywhere to begin!*

Message on plaque:

> *Dinosaurs' body parts helped them find food and fight.*
> *Which parts would you use to make*
> - *a meat-eating predator?*
> - *a peaceful plant-eater?*
> *Build one now, and see if you can make it walk, eat, and fight*

Purpose:

Intended takeaways	Mechanism/ Phase of game	Implicit/ Implied	Does it serve the purpose?
Life was dangerous and short at the top of the food chain	Choose what to eat Choose territory to traverse	Implied	
Both predator and prey animals had body parts that enabled them to be successful in the cretaceous	Build & test lab	Implicit	Yes
What was it like to be a top predator?	Choose what to eat Choose territory to traverse	Implicit	Yes
Some dinosaurs helped each other	None		

Visual Design

The visual design is bright and attractive to the target audience. The graphics do not seem too outdated with the visitors' tastes.

Interaction Design

The flow of information and gestures though the game are noisy and jittery. Information is displayed through wordy messages displayed on pop-ups that appear on the screen breaking the flow. The controls that are used for changing sizes are not in line with the mental models of the audience. The younger audiences seem to have a difficulty comprehending the current usage of control through trackball and button unless demonstrated. They head for using the touch screen and are oblivious to the platform with the trackball and button.

Ethnography:

Approach

The researcher used a hybrid approach involving shadowing and contextual inquiry. The researcher shadowed most participants who used the interactive exhibit. For some users, depending on feasibility, the researcher conducted contextual inquiry by going through the steps required to accomplish the goal with the participants.

Participants

21 users were observed using the interactive exhibit on 08 June 2016 and 09 June 2016.
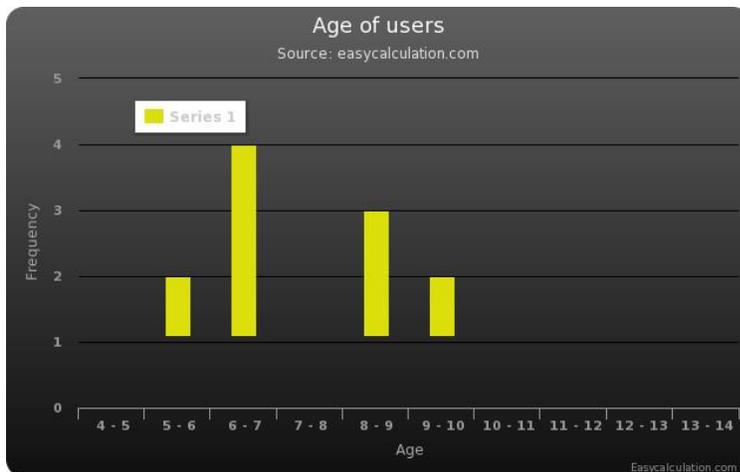
Comprehension

Majority of the observed users did not yet learn to read and so did not comprehend messages displayed on the screen. This also impeded them from progressing to the further tasks that required them to choose an option based on text. But when the 'build lab' screen is open, the visitors didn't seem to have any difficulty understanding the goal.

Ergonomics

The mental models of ergonomics changed with the mental models of interaction with the device. Given the audience the interactive exhibit is now used by as opposed to who is was intended for, the height of the seat is not proportionate to the height at which the screen is placed. From observation, the users are not tall enough to be able to touch the screen while seated. This brings up a few safety concerns and the need to avoid falls and accidents.

Game Dynamics

In most of the incomplete cases, the visitors abandoned the game during the build phase usually after an unsuccessful build. Once they finished the build successfully, they finished the game and/or repeated the game. Visitors were seen repeating the game unless they were distracted or had to leave due to time constraints.

Most of the visitors observed seemed to comprehend the first phase but the later parts of the game were difficult to understand for the younger visitors who needed assistance with reading. So, it is safe to assume that the trial and error was based on a dynamic strategy that they formulated after every failed attempt.

Social Interaction

The interactive exhibit engendered interaction among the family members if the primary child was below the age of 7 and couldn't read the instructions very well. If the group had more than one child, the children seem to implicitly share the seat and use the screen and controls collaboratively. If however, the group had only one child, the interactive didn't require collaboration between the family members or with other visitors as long as the child could read and follow instructions.

Re-Design Suggestions:

- Pop-ups crowd the screen currently and do not allow for a smooth flow.
- Messages are too long and wordy and high in frequency. The information has to be incorporated in the flow of visuals and fame mechanics.
- The screen saver that says 'Touch anywhere to begin' is used more than once and could be replaced with a better visual illustrating the goal of the game.
- It would be easier for the target audience to use a full touch screen with gestures that are consistent with smart phones and tablets.
- The functionality of close menu options is redundant and isn't used at all.
- Choosing options could be more visual rather than based on only text.
- The build lab shows scales for speed, defense, attack and balance on the bottom right and also a line that shows balance. Balance is shown in two different ways and the scale seems redundant. Also, the use of other scales is yet to be investigated. Because these are not in the visual focus of the user, there is a probability that the user is banner-blinded by the bright scales.
- For each option selected, more textual information is provided on the bottom left hand side of the screen which is usually not read by the reader. The usefulness of this information is debatable. But it also depends if the purpose of the game is to reinforce the learning or to test it.
- The placement of the screen obstructs the proper view because of the glare. However, the newer retina displays might not suffer from this issue if it were to be replaced by such a screen. Else, the view from angle at which it will be placed has to be studied for various light shows on the dome.

Family Crests

This section discusses the evaluation of the interactive exhibit, Family Crests, using usability inspection and ethnography.

Usability Inspection:

Content
This is a simple matching game in which cards are presented in a grid and under each card is a unique head crest which matches with the crest under only one other card in the grid. It has a single and 2-player mode and two levels until the finish.

Introduction Text:

> *Dinosaurs identified family members by the shape and size of the head crests.*
> *Click on the two squares to match family head crests.*
> *Try to make the matches as fast and in as few turns as possible, to receive a bigger score.*

Message on plaque:

> *Duckbill dinosaur families… found each other by the size or color of their heads.*
> *How do you find your family in a herd?*
> *Fossils don't tell us … the color of hypacrosaur head crests.*
> *We looked at modern animals to guess colors and markings.*

Purpose:

Intended takeaways	Mechanism/ Phase of game	Implicit/ Implied	Does it serve the purpose?
Duckbill dinos might have used the crests on their heads to identify each other in the herd	Introduction text Matching game	Implicit Implied	No
Duckbill dinos lived in family groups	None		
Crests helped young dinos find a parent	None		

Visual Design
The colors used on the screen are greyed and gloomy. The graphics are 2-D and look antiquated. The content occupies only a part of the screen and the left and right edges of the screen are greyed out.

Interaction Design
The game could be operated using trackball and button and/or touch screen. The touch screen is responsive enough to play the game. All the options, for example, "press button to start", "end game?" etc. are presented as text but do not have a touch/click area defined by a boundary. That makes it difficult to hit the exact target. Also, the text, "press button to start", is displayed at the bottom of the screen without drawing any attention to it. On the screen that displays options to selection 1 or 2-player game, the images (heads) could be perceived as targets and the text below could be easily missed.

Ergonomics

The trackball isn't smooth or precise enough to target specific areas like the text. Both the input methods could cause muscular fatigue by the time a user finishes playing both the levels given the height of the seating. The bench or controls provided at the kiosk are not enough for two players to comfortably operate from the same position. Although there is an extra bench, it is unclear if it should be used at this kiosk.

Ethnography:

Approach

The researcher shadowed 11 users using the interactive exhibit on 16 June 2016.

Game Mechanics

The motive behind having two levels in the game is unclear as nothing changes in the second level. It is based on memory and the two-player game doesn't seem to engender any family learning at the outset.

Game Dynamics

Unless it is a 2-player game, the users do not need any help or cooperation to play the game.

Social Interaction

Although the game mechanics do not engender social interaction, when there are children in a visitor group, they do tend to group around but later disperse to other kiosks around.

Re-Design Suggestions:

- The placement of the screen obstructs the proper view because of the glare. However, the newer retina displays might not suffer from this issue if it were to be replaced by such a screen. Else, the view from angle at which it will be placed has to be studied for various light shows on the dome.
- The entire plot needs re-design to incorporate the intended lessons. Also, the designer has to be clear about the purpose of the lesson – reinforcement by repetition or test.

Track the Herd

This section discusses the evaluation of the interactive exhibit, Track the Herd, using usability inspection and ethnography.

Usability Inspection:

Content

The goal of the game is to track the hypacrosaurus herd based on the foot prints of the herd. At the onset, the payer is given a short tutorial of the footprints of various dinosaur families. After that, the player has to recognize various footprints and follow the hypacrosaurus footprints until the herd is found before the dinosaur runs out of health. Health is replenished every time the player recognizes the footprints right. Although the health is a metaphor used to measure time, it doesn't fit into the plot and the player has no way to replenish it after one round of question and answer.

Introduction Text:

> *Oh No! You're a young duckbilled dinosaur and you have lost your herd!*
> *Can you find your family? Good Luck!*

Message on plaque:

> *Duckbill dinosaur families… traveled in a herd to stay safe.*
> *How do we know that?*
> *Trace fossils like footprints shoe big and little prints side-by-side.*

Purpose:

Intended takeaways	Mechanism/ Phase of game	Implicit/ Implied	Does it serve the purpose?
Fossils tell us dinos hunted and travelled in teams	Introduction text	Implicit	No
	Goal of the game	Implied	Yes
Herds migrated to find food	None		

Visual Design

The graphics are in 2-D and brightly colored. After each move, the visual perspective of the dinosaur changes drastically instead of gradually and so the visuals lack a natural feel to them.

Interaction Design

The game could be operated using trackball and button. The trackball isn't smooth or precise enough to point and move the dinosaur before it runs out of energy.

Ergonomics

Constantly using the trackball and button through the length of the game could cause muscular fatigue.

Ethnography:

Approach

The researcher shadowed 13 participants who used the interactive exhibit followed by a contextual inquiry with 5 participants on 16 June 2016 and 17 June 2016.

Game Mechanics

The game is perceived hard to win or gain points. Out of the 18 participants, only two repeated the play but lost nevertheless. Only one participant was observed to finish the game and win but it could very well be because s/he started it midway where the previous participant left. A few reasons the participants listed were:

- "It is difficult to remember which footprints belong to the hypacrosaurus herd."
- "It is difficult to see where the dinosaur came from."

Game Dynamics

Overall, the game didn't seem to delight players or teach the intended lessons.

Social Interaction

Although the game mechanics do not engender social interaction, when there are children in a visitor group, they do tend to group around but later disperse to other kiosks around.

Re-Design Suggestions:

- The placement of the screen obstructs the proper view because of the glare. However, the newer retina displays might not suffer from this issue if it were to be replaced by such a screen. Else, the view from angle at which it will be placed has to be studied for various light shows on the dome.
- The entire plot needs re-design to incorporate the intended lessons. Also, the designer has to be clear about the purpose of the lesson – reinforcement by repetition or test.
- If however, the designer does make the decision to retain the game due to its familiarity, individual tasks need to be defined and the difficulty level should be set for the target age group of the audience.