

Heuristic Evaluation of Math Out of the Box



1. Problem

Math Out of The Box is a mobile application that encourages a passion for math in children by teaching them the real-life applicability of math problems through practical activities.

2. Violations Found

1. [H2-4 Consistency and standards] [Severity: 3] [Found by: B]

During the challenge tutorial, there are two buttons that say 'I want to know my speed', back-to-back. Having both of these buttons can confuse the user, as they may not understand why they have to do the same thing twice. Maybe the change the name of the first button and make it say something that can lead into the next screen.

2. [H2-4 Consistency and standards][Severity 2] [Found by: B, A, D]

The buttons throughout the application are rather distracting and not consistent. Sometimes the dialogue within buttons is not necessarily all needed, although it is fun. Also, sometimes the buttons seem randomly placed instead of having a convention throughout the app for where buttons should be. For example, the second 'I want to know my speed' button is yellow while all the other buttons in the challenge are green. The inconsistency can be confusing. Create a fun, but minimalist button type that is used throughout the app.

3. [H2-4 consistency and standards][Severity 3] [Found by: B]

The 'I'm not sure' button for the speed challenge covers simple division sometimes and long division at other times. That can be confusing. Maybe, after showing users how to find the speed with simple division, have a button allowing them to see a tutorial on doing long division.

4. [H2-8 aesthetic and minimalist design][Severity 2] [Found by: B, D]

After clicking the 'write on his wall' button, the dialog that appears is a little wordy. Specifically, the last sentence is repetitive. And it's hard to tell apart from people that I can send the message and those who I can't. Change the color of the button maybe.

5. [H2-1 Visibility of system status][Severity 3] [Found by: A, D]

Once you click the child or parent button, you can't tell who you are logged in as at the home page. With multiple children and adults using the app on the same device, users may get their profiles mixed up. Insert the name of the user in front of the "Logout" button (i.e. Logout Brandon). Additionally, you are logged in when entering the app but are never asked to log in (perhaps this is just hard-coded because of the prototype). Put a login even if the user and password are already fill out or use iOS digital print to sign in

6. [H2-7. Flexibility and efficiency of use][Severity 3] [Found by: A,D]

The plus and minus signs on lessons are not very intuitive or efficient. Children may not recognize this convention and this may slow down their interaction when trying to switch from one lesson to another. On top of that, whenever I want to start a new challenge on the Challenge list, I need to do 2 clicks. I click to expand the challenge and then click to start. Perhaps switch to a traditional table view style list of lessons or an option to start directly from the list view

7. [H2-8 Aesthetic and minimalist design][Severity 4] [Found by: A, C, D]

Within the actual lessons, multiple background images and a variety of color schemes distract from the overall purpose of the app. Specifically, changes in the color of the instruction “bubbles” may confuse users. Instead use color for accent and purpose instead of making everything really colorful.

8. [H2-4 Consistency and standards][Severity 3] [Found by: A , D]

When you click “Challenge of the Week” from the child home page, multiple lessons appear. It is assumed that the first lesson is the challenge of the week; however, children may not realize this is the lesson they are supposed to do and instead incorrectly click another lesson. Instead only have the one lesson visible and then enable the rest of the lessons by clicking back and clicking on the button for other lessons.

On top of that, the challenges screen are different depending from where I enter. If I enter through "Challenges of the Week", I will see only two challenges with the first one open. But if I enter through "Other challenges", I see the same screen but with two additional challenges and the first one now collapsed. This leads to a consistency problem. Both buttons take to the same screen. This could be simplified to just one button that would take me to the challenge screen. Although, it is assumed that if you are a new user, you will access only the "Challenge of the Week" while if you are a power user you would go to "Other challenges", you are not the interface efficient to use. Because the "Other challenges" takes you to more options but the button is hidden when compared to "Challenge of the Week". This may lead the user to constantly clicking in "Challenge of the Week" while expecting to go to the "Other challenges" screen.

9. [H2-2. Match between system and the real world][Severity 4] [Found by: A, C, D]

Although the app effectively speaks the users’ language, the quantity of text does not coincide with the real-world attention span of young children. It feels that the large amount of text pulls the focus away from math and more towards reading and comprehension. Limit the amount of text per instruction to only a couple sentences, and definitely not whole paragraphs. Throughout the lesson, instructions often give a bunch of steps at once, forcing the user to remember information from multiple paragraphs all on one page. Children may forget or get distracted easily, resulting in them not finishing the lesson. Split up tasks into more mini steps that force more interaction between steps so users don’t have to recall information. Ask the kid to input the time is too much information. And instead of taking the kid out of the flow to show the stopwatch, the stopwatch could be already accessible in that page.

10. [H2-3 User control and freedom][Severity 4] [Found by: A, B, C, D]

Throughout the app, backwards navigation is frequently missing and sometimes hard to find. Specifically, there is no back button between steps in the tutorial and no back button on parent home page. A large consistent convention for a back button would decrease the chance of users making a mistake and getting lost. For instance, if the user enters the system as a parent and "Check out this week challenge", I can go back to my main page leading to user frustration. On top of that, there is no backwards navigation once a user is at the child home page or the parent homepage. The logout button from child home page should go back to where they can log in as parent or as a child.

11. [H2-8 Aesthetic and minimalist design][Severity 2] [Found by: A]

The distracting image behind tool items in toolkit makes it difficult to distinguish foreground and background. With users already having to recognize the image of the tool they want, taking up the whitespace in the background makes things more cluttered and confusing. Remove the background image.

12. [H2-4 Consistency and standards][Severity 3] [Found by: A, D]

On the user's profile page, "friends" looks like a button, but it is very unclear what it does. User's may think that this is an action to "Friend" that individual instead of a way to see that individual's friends. Perhaps add more text to the button to clear up any confusion (i.e. "See Brandon's Friends). And there are inconsistencies on the profiles. For instance, on the profile of Brandon, when I click on Elia it takes me to Elia's profile while when I click in Matthew it takes me to the chat screen.

13. [H2-8 User control and freedom][Severity 2] [Found by: A, C, D]

The flow of the profile page is clunky due to large overlapping (button-like) text bubbles, a lack of grouping and alignment, and sizing problems. For example, the profile picture is very large, and becomes the sole focus of the page. Additionally it is hard to tell what is a button and what is not. Perhaps simplify the profile page by making non-actionable text look less like buttons and by aligning/fixing the size of elements.

14. [H2-5 Error prevention][Severity 1] [Found by: A]

There are issues between landscape and portrait mode in viewing certain sections of the app. For example, problems occur when the profile is in landscape, but problems occur when the home page is in portrait. This may just be a function of the fact that this is a prototype. In final version, either lock the app in one orientation or make sure all screens work in both orientations.

15. [H2-2 Match between system and the real world][Severity 4] [Found by: A]

The lesson doesn't really follow the format of how a child would solve a similar problem in the real world. For example, the problem (x / y) is set up for them and all they have to do is the division. The help button gives all of the steps without explaining each step as a child may need in the real world. It makes more sense for the lesson to make them setup the problem, and if they need help to give them step by step help.

16. [H2-7. Flexibility and efficiency of use][Severity 2] [Found by: A, D]

The navigation arrows in the parent's statistic view forces the parent to go through all the graphs even if they are trying to look at just one. To view any graph, they get stuck in this linear flow and can only get back through repetitive back clicks. Instead enable users to access the graphs via a table view in addition to scrolling with navigation arrows. On the graphs screen, it is not intuitive that the left arrow

on the first graph or the right arrow on the last graph is going to take me back to the kids profile. And the arrow is not consistent with the behavior of the arrows on other graph screens - the left arrow on the second screen take me back to the first graph and not to the kid's profile.

17. [H2-1 Visibility of system status][Severity 2] [Found by: A]

Within the statistics view, a parent cannot tell what child they are viewing. If they have multiple children, not having the child's name on the report may make it confusing for the parent to digest the information. Instead, have the child's name at the top with the title of the statistical graph.

18. [H2-10. Help and documentation][Severity 5] [Found by: A, D]

Within the parent view, what is going on in the graphs is unclear. Parents may not know what lines represent their child, class averages, or national averages. The information here is also not easy to search or quickly digest. It is unclear how performance is measured (there are no numbers). Provide simple, labeled graphs in an easily navigable fashion.

19. [H2-10: Documentation] [Severity 1] [Found by D]

Readme doesn't have support to what the app does, but only about what the app doesn't do. So it makes harder for the user to get help and understand how a specifically functionality work. Create a readme around the tasks you have design the app for and explain how to use features to solve those problems

20. [H2-8. Minimalist design] [Severity 2] [Found by D]

On the kids' profile for the parents, the information more visible is the kid's picture which may be the most irrelevant information for the parent at the screen. Every parent know their kid, but they are more interest in knowing what they are using the app for. Reduce the image and structure the kid's app usage information to make it more evident to the parent.

21. [H2-8: Minimalist Design] [Severity 3] [Found by D]

The challenge top score shows the speed of each kid. But that is not what the app is about. The app is not trying to make kids run faster or practice more exercise. The app is trying to teach math. Put a better metric on the scoreboard like accuracy measuring speed.

22. [H2-7: Efficiency of Use] [Severity 2] [Found by D]

Ask the kid to measure distance drives the user away from the task and ask too much information. On top of that, the app should help kids learn math and not how to use a tape measure. If the app aims to teach that, it needs a lot of hints to help the kid read the tape measure. Possibly measure the distance using GPS.

23. [H2-7: Efficiency of Use] [Severity 3] [Found by D]

The button "Do another challenge" takes me to the home and not challenge list. Take the user to the list of challenges.

24. [H2-4: Consistency] [Severity 2] [Found by D]

On the screen after I get my speed correctly, there is a button to "Try another problem" while in other parts of the system the phrase used is "Try another division problem". Use the same label.

25. [H2-8 Aesthetic and minimalist design] [Severity 4] [Found by C]

In the toolbox, the design may be too minimalist. Each icon is slightly unclear as to its function – what does the pencil do? What does the graph do? Add text labels to the icons.

26. [H2-4 Consistency and Standards] [Severity 2] [Found by C]

For each friend’s profile, there is a navigation bar at the top with both a back button and a home button that apparently does the same thing. Just include one navigation button to go back.

3. Summary of Violations

Category	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (sev 5)	# Viol. (total)
[H2-1: Visibility of Status]		1	1			
[H2-2: Match Sys & World]				2		
[H2-3: User Control]				1		
[H2-4: Consistency]		3	4			
[H2-5: Error Prevention]	1					
[H2-6: Recognition not Recall]						
[H2-7: Efficiency of Use]		2	2			
[H2-8: Minimalist Design]		4	1	2		
[H2-9: Help Users with Errors]						
[H2-10: Documentation]	1				1	
Total Violations by Severity	2	10	8	5	1	26

4 Evaluation Statistics

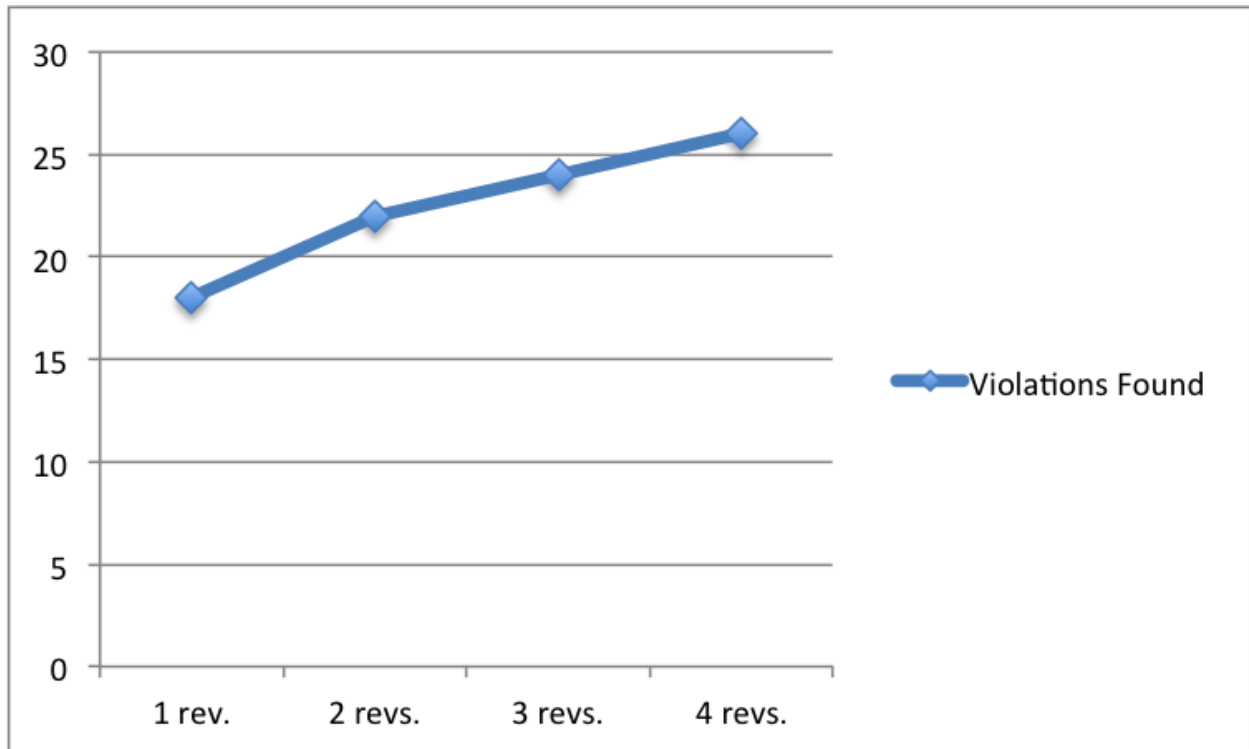
severity\evaluator		evaluator A	evaluator B	evaluator C	evaluator D
level 1		1			1
level 2		5	2	2	7
level 3		4	2		6
level 4		4	1	4	3
level 5		1			1
total (levels 4 & 5)		5	1	4	4
total (all levels)		15	5	6	18

severity\evaluator		evaluator A	evaluator B	evaluator C	evaluator D
level 1		50%	0%	0%	50%
level 2		31%	13%	13%	44%
level 3		33%	17%	0%	38%
level 4		33%	8%	33%	25%
level 5		50%			50%
total (levels 4 & 5)		36%	7%	29%	29%
total (all levels)		34%	11%	14%	41%

evaluator # Ex. C	# problems found Ex. 7	unique problems remaining & problem IDs Ex: 5 (1, 7, 11, 13, 17)
A	4	4 (1, 3, 25, 26)
B	2	0
C	2	2 (1, 3)
D	18	8 (1, 3, 11, 14, 15, 17, 25, 26)

CS 147 Autumn 2014: Assignment 13

Instructor: James Landay



Severity Ratings

- 1- don't agree that this is a usability problem
- 2- cosmetic problem
- 3- minor usability problem
- 4- major usability problem; important to fix
- 5- usability catastrophe; imperative to fix

Heuristics

[H2-1: Visibility of System Status]

- keep users informed about what is going on

[H2-2: Match Between System & Real World]

- speak the users' language
- follow real world conventions

[H2-3: User Control & Freedom]

- "exits" for mistaken choices, undo, redo
- don't force down fixed paths

[H2-4: Consistency & Standards]

[H2-5: Error Prevention]

[H2-6: Recognition Rather Than Recall]

- make objects, actions, options, & directions visible or easily retrievable

[H2-7: Flexibility & Efficiency of Use]

- accelerators for experts (e.g., gestures, kb shortcuts)
- allow users to tailor frequent actions (e.g., macros)

[H2-8: Aesthetic & Minimalist Design]

- no irrelevant information in dialogues

[H2-9: Help Users Recognize, Diagnose, & Recover from Errors]

- error messages in plain language
- precisely indicate the problem
- constructively suggest a solution

[H2-10: Help & Documentation]

- easy to search
- focused on the user's task
- list concrete steps to carry out
- not too large