

**Usability Study 2 -BinaryKids  
(Study Conducted after Demo)**

**Explanation given to users:** BinaryKids is an education application that teaches middle school-aged students about binary numbers and their importance. It has 5 main parts, an introduction to binary numbers, a decimal to binary number conversion tutorial, a binary to decimal number conversion tutorial, practice problems, and a game to test conversion skills.

**User One:**

Name: Chris Bussing

Demographic:

- Senior
- Economics
- Age 22
- No computer science experience
- A little exposure to binary numbers
- High school calculus

**User Two:**

Name: Harry Xu

Demographic:

- Senior
- SFS
- Age 22
- No computer science experience
- Some exposure to binary numbers
- Linear algebra

**User Three:**

Name: James Gewanter

Demographic:

- Freshman
- Undecided
- Age 19
- No computer science experience
- No exposure to binary numbers
- Calculus

\*Despite the fact that these users are not in BinaryKids' target demographic, we believed they were a semi-accurate representation of students who might use BinaryKids in that they had limited exposure to binary numbers

### **User Response Summary:**

Response to the application was much more positive than for our prototype. Users generally liked the color design, layout, and images. They found the amount of text on the screen to be more reasonable and easier to read than in the prototype.

Users found the purpose of the application very clear and generally learned a lot. By the time the users played the game, we observed that they had become much faster at converting than they were when doing the tutorials or practice problems.

Modifications made after the second usability study were largely aesthetic: changing the dimensions of the screen, changing the location of the button panel to more intuitively reflect user eye movement, getting rid of extra buttons where they were confusing in the tutorial pages. The content seemed to be well reviewed, and as such was kept largely the same. Modifications were made to the game instructions page to more clearly articulate the purpose of the game, and better position the game elements on screen.

### **User One:**

1. On a scale from 1-5 (1 being none at all, 5 being a lot), how much did you learn using this application?
  - 1: nothing
  - 2: very little
  - 3: one new thing
  - 4: several new things
  - 5: a lot
2. On a scale from 1-5 (3 being perfect) how would you rate the amount of text per screen?
  - 1: too little
  - 2: could be more
  - 3: the right amount
  - 4: a little overcrowding
  - 5: way too much
3. The different components of the application (titles, text, buttons, instructions) were easy to see and read.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree
  - 5: strongly agree
4. It was easy to keep track of the progress I was making in completing tutorials.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree

5: strongly agree

5. The application got boring after a while.

1: strongly disagree

2: disagree

3: neutral

4: agree

5: strongly agree

6. The animations made the concepts clearer and easier to understand.

1: strongly disagree

2: disagree

3: neutral

4: agree

5: strongly agree

7. Navigating from page to page, back to the start screen, and closing the application was straightforward and intuitive.

1: strongly disagree

2: disagree

3: neutral

4: agree

5: strongly agree

8. On a scale from 1-5, how clear were the instructions of the application?

1: extremely unclear

2: unclear

3: neutral

4: clear

5: very clear

9. On a scale from 1-5, how clear was the purpose of the application?

1: extremely unclear

2: unclear

3: neutral

4: clear

5: very clear

10. The game allowed me to successfully apply what I had learned about binary/decimal conversion to get correct answers and get a high score.

1: strongly disagree

2: disagree

3: neutral

4: agree

5: strongly agree

11. What did you like most about this application?  
I thought the lessons were very clear and easy to follow and I had a lot of fun with the game. The images were fun (I enjoyed the wolf/dog with the binary numbers in its mouth). The game was pretty easy to play and visually interesting and easy to follow along with. I liked the time constraint which made the game more exciting.
12. What did you like least about this application?  
It was great. Obviously you just need to correct the pop up boxes which displayed an x when I had the correct answer. Also, the moving of the squares into the boxes was a little difficult as I had to double and triple click sometimes to move them.
13. Can you suggest any improvements to the interfaces?  
Mentioned above.

**User Two:**

1. On a scale from 1-5 (1 being none at all, 5 being a lot), how much did you learn using this application?
  - 1: nothing
  - 2: very little
  - 3: one new thing
  - 4: several new things
  - 5: a lot
2. On a scale from 1-5 (3 being perfect) how would you rate the amount of text per screen?
  - 1: too little
  - 2: could be more
  - 3: the right amount
  - 4: a little overcrowding
  - 5: way too much
3. The different components of the application (titles, text, buttons, instructions) were easy to see and read.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree
  - 5: strongly agree
4. It was easy to keep track of the progress I was making in completing tutorials.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree

5: strongly agree

5. The application got boring after a while.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree
  - 5: strongly agree
6. The animations made the concepts clearer and easier to understand.
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  - 4: agree
  - 5: strongly agree
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  - 1: extremely unclear
  - 2: unclear
  - 3: neutral
  - 4: clear
  - 5: very clear
9. On a scale from 1-5, how clear was the purpose of the application?
  - 1: extremely unclear
  - 2: unclear
  - 3: neutral
  - 4: clear
  - 5: very clear
10. The game allowed me to successfully apply what I had learned about binary/decimal conversion to get correct answers and get a high score.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree
  - 5: strongly agree

11. What did you like most about this application?  
Simple design was easy to use, liked the game idea but the color scheme of game doesn't quite match the rest of the applet
12. What did you like least about this application?  
Moving the squares to the boxes was a little difficult
13. Can you suggest any improvements to the interfaces?  
Wish game had a highscore feature

**User Three:**

1. On a scale from 1-5 (1 being none at all, 5 being a lot), how much did you learn using this application?
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  - 2: very little
  - 3: one new thing
  - 4: several new things
  - 5: a lot
2. On a scale from 1-5 (3 being perfect) how would you rate the amount of text per screen?
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  - 1: strongly disagree
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  - 4: agree
  - 5: strongly agree
5. The application got boring after a while.
  - 1: strongly disagree

- 2: disagree
- 3: neutral
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- 5: strongly agree

6. The animations made the concepts clearer and easier to understand.
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  - 1: extremely unclear
  - 2: unclear
  - 3: neutral
  - 4: clear
  - 5: very clear
9. On a scale from 1-5, how clear was the purpose of the application?
  - 1: extremely unclear
  - 2: unclear
  - 3: neutral
  - 4: clear
  - 5: very clear
10. The game allowed me to successfully apply what I had learned about binary/decimal conversion to get correct answers and get a high score.
  - 1: strongly disagree
  - 2: disagree
  - 3: neutral
  - 4: agree
  - 5: strongly agree
11. What did you like most about this application?  
Good use of graphics, animations, and games to help make learning more fun
12. What did you like least about this application?

It would have been nice to have a progress bar at the bottom so you know how far along you are in the tutorials

13. Can you suggest any improvements to the interfaces?

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