

# Expert review of Calcoid™ by PCMasterRace

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## Introduction

We at PCMasterRace are researching the usability of the Calcoid™ calculator app. It's an advanced calculator app, with more functions than your average calculator, but we want to know: is it usable? We tested the usability through methods made by Jakob Nielsen, a guru when it comes to usability research. Nielsen's heuristics allow us to rate the usability of this application through various methods.


## Personas

On the following pages you will find the personas that we chose to use for this research project. We chose these personas because they are young (and thus probably have a phone capable of running applications) and are both dependent on math for their study/work. We chose a CS student and an accountant. We can relate to a CS student and know that he will probably want to do some quick calculations on his phone. As for the accountant, we're not so sure, but his work surely involves a lot of math.

## Persona 1:

|   |  |
|---|--|
| <b>Persona:</b>                               | CS Major student   |
| <b>Photo:</b>                                 |   |
| <b>Fictional name:</b>                        | Alex Boyka   |
| <b>Job title/<br/>major responsibilities:</b> | President of CS study union  |
| <b>Demographics:</b>                          | <ul style="list-style-type: none"><li>• 23 years old</li><li>• Single</li><li>• Enjoys playing video games a lot</li><li>• Has a CS bachelor degree</li></ul>  |
| <b>Goals and tasks:</b>                       | <p>He is focused, goal-oriented within a strong leadership role. One of his concerns is improving the CS study quality.</p> <p>Spends his work time:</p> <ul style="list-style-type: none"><li>• Doing homework</li><li>• Managing the study union</li></ul> |
| <b>Environment:</b>                           | He is comfortable using a computer and really enjoys math.   |

## Persona 2:

|   |   |
|---|---|
| <b>Persona:</b>                               | Accountant at construction company Aalberts   |
| <b>Photo:</b>                                 |    |
| <b>Fictional name:</b>                        | Herman ten Haave  |
| <b>Job title/<br/>major responsibilities:</b> | He takes care of the in- and outgoing transactions at Aalberts  |
| <b>Demographics:</b>                          | <ul style="list-style-type: none"><li>• 35 years old</li><li>• In a relationship</li><li>• Has an economics master's degree</li></ul>   |
| <b>Goals and tasks:</b>                       | <p>He is very obedient to his boss and doesn't like going home late.</p> <p>Spends his work time:</p> <ul style="list-style-type: none"><li>• Taking care of transactions</li><li>• Browsing reddit</li></ul> |
| <b>Environment:</b>                           | He is very enthusiastic about economics and math, but shies away from technology, as he doesn't really feel comfortable with it.  |

## Heuristic evaluation

### **Setup**

#### Evaluators:

We at PCMasterRace have 4 evaluators, namely the 4 authors of this project: Bart, Laurens, Martin and Maxim.

#### Scenario's:

These are the scenario's we came up with. These are all possible with the Calcoïd™ app. We performed these scenario's and wrote down the problems that we encountered.

|    |   |
|----|---|
| 1. | A friend asks the user what square root of 117 times 12 is, the user calculates and responds.         |
| 2. | The user has to send the sum of his prices of his shopping list to his mother through a text message. |
| 3. | The user has to calculate the last 5 digits of $99^9$ .   |

### **Aggregate findings**

#### Heuristic categories

These are Nielsen's 10 categories. We highlighted a word from every category so we can easily reference category.

**Visibility** of system status

**Match** between system and real world

User control and **Freedom**

**Consistency** and standards

**Error** prevention

**Recognition** rather than recall

**Flexibility** and efficiency of use

**Aesthetic** and minimalistic design

**Help** users recognize, diagnose and recover from problems

Help and **Documentation**

Source: <http://www.nngroup.com/articles/ten-usability-heuristics/>

The following evaluations are found by us, the evaluators. The word in bold referenced the category that the evaluation belongs to.

#### Interface evaluation:

1. **(Aesthetic)** The screen is too cluttered.
2. **(Freedom)** No landscape mode.
3. **(Recognition)** The buttons are self-explanatory with exception of X2, X3, deg/rad.
4. **(Consistency)** Placement of buttons (especially the 'C'-button) isn't intuitive.

5. **(Flexibility)** Menu buttons are covered by the Android menu bar.

App use evaluation:

6. **(Aesthetic)** The arrow button in the top right corner (indicating if there are more numbers to the right) is pressable, but it does nothing.
7. **(Aesthetic)** When scrolling to the right to reveal the lower numbers, there's no indication of being at the end.
8. **(Consistency)** The calculator doesn't have an 'ans'-button, which usually stores the last calculated number.
9. **(Flexibility)** You can't copy or paste numbers from/to the calculator to/from clipboard.
10. **(Consistency)**  $e$  and  $\pi$  completely clutter the result box, because they show in their decimal representation, instead of just letters.
11. **(Help)** When an error occurs you HAVE to press the 'C'-button, any other button doesn't do anything (including the backspace button).
12. **(Consistency)** When calculating large numbers, the calculator doesn't switch over to a scientific notation, but instead shows a very, very long number.
13. **(Visibility)** When using the 'M+'-button you store your current number, but it disappears from the screen when doing so, making you think you're back to 0. But when you press another button it continues with the number you previously saved.
14. **(Freedom)** By turning on the immersive mode the "=" and some other buttons are not fully visible until you restart the whole app

## **Problem classification**

### Ratings:

**0** = I don't agree that this is a usability problem at all:

2, 4

**1** = Cosmetic problem only: need not be fixed unless extra time is available on project:

1, 6, 9

**2** = Minor usability problem: fixing this should be given low priority:

7, 10, 11, 12

**3** = Major usability problem: important to fix, so should be given high priority:

5, 8

**4** = Usability catastrophe: imperative to fix this before product can be released:

-

### Categories and personas:

The following list of problems are chosen from the problems that we, the evaluators found, The problems are selected by relevance to the persona.

#### **Possible problem for Alex Boyka:**

5: Alex can write android applications himself and knows how to prevent this problem, which is why it annoys him even more.

7: Alex does more than just adding two numbers, he wants to be able to expand on his previous calculations, an 'ans'-button would be easier than using the 'M'-buttons.

8: Alex likes to share his solutions with his peers, but he can't copy the result of his calculation to his messenger app.

11: Alex has to calculate his math problems with big numbers. Because Calcoïd™ doesn't support the scientific notation, he has to scroll all the way through the result to find how many digits the number has.

#### **Possible problems for Herman ten Haave:**

1: He is used to the original calculator, so he has some problems with the more compact design of Calcoïd™.

3: Since he doesn't have these buttons on his regular calculator he doesn't want to learn them, or even needs them, but there is no option to show/hide the scientific buttons, making the screen more cluttered than necessary.

6: Herman doesn't really understand what this button is for, but he's annoyed by the fact that it's there and doesn't seem to have a real use.

10: Usually the backspace button or typing a new number makes 'Error' in the result box go away, but with this app you need to press the C button to continue using the calculator. Herman just wants an app that works like his regular calculator and is annoyed by this.

We assumed that Alex didn't mind some bugs because he will probably find a workaround and get used to it, but he is missing some key features. As for Herman, he just wants the app to work, no workarounds, just like his regular calculator.

## Conclusion

Currently none of us would use this app over the default calculator app that is installed to our phones already.

Although the app looks like it's pretty beautiful in the screenshots, it doesn't live up to its promises. The minor thing that Calcoid™ does better than our current (standard) calculators is the fact that it can calculate way bigger numbers (the standard app already goes pretty far, so it's not a major pro) and it has some soothing backgrounds.

At the moment there are just too many bugs / annoyances and too little advantages in using this app. Especially the **Flexibility** of the app is lacking, with two problems that fall into 'Major usability problem' rating.