Academic evaluation of MathDragOn

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Abstract:

In order to investigate both the functionality and the intuitiveness of the MathDragOn application a research was conducted at Cals College Nieuwegein.

With little explanation and a sheet of fitting questions for VWO 5 and 6 Maths B a group of math teachers had to work with the application in order to test intuitiveness and functionality. After a few necessary adjustments the application proved to be intuitive and accessible and had as only downside the somewhat slow speed of input.

 In the end it received an average of 7,4 whilst bearing the expectations which a professional developer would bear.

Introduction.

To test the comfort and functionality of the android application called MathDragOn a small two-day research was conducted. Developers of the application headed out to the Cals College Nieuwegein to hand over the application to a total of seven math teachers.
The application was handed over with little explanation to test the intuitiveness and with a sheet of exercises to test the application with.
The main questions asked during the experiment were:

1. Is the application intuitive?
2. Is it functional?
3. Would you like it if your students had access to this application at home?

And a small markings sheet was attached to provide statistics of the app.

Methodology.

The first day only two teachers were interviewed. A number of protruding problems were fixed with their feedback. This enabled the second day to be a more productive day as the main problems were already resolved.

Each teacher was handed a mobile device with a pre-installed MathDragOn Application.

After a brief and basic explanation on how the application worked and what the general uses of the application are they were handed a (digital) sheet with exercises containing both central VWO 6 exam content and basic VWO 5 practice. The sheet is included in the appendix.

During their testing they were allowed to ask questions and give feedback on situational bugs and misunderstandings which were noted for later adjustment. Each time they did not understand how the application worked the specific situation was noted to be included in the coming tutorial for the application.

After the testing the teachers were first questioned about their experience with MathDragon and after asked to give marks ranging from one to ten for preselected categories.

Findings.

In general, the findings indicated that although the application could do what it was supposed to do it did not work efficient enough. The main issues with the application were the speed at which formulas and equations could be filled in and the form in which answers were returned.

The first day required a few basic fixes which were:
    1. A fast way to type polynomials as they were so frequently used and dragging and dropping pluses and minuses was hence too slow.

1. Returning answers in a more commonly used form.
2. Better usage of brackets.

The second day the main points of improvement were:

1. Making a button with which integrals and deviations were automatically added.
2. Removing functionalities which were not part of the standard VWO program.
3. Adding a loading animation for when the answer was being calculated.

Results of the mark sheet:

Categories	T 1.1	T 1.2	T 2.1	T 2.2	T 2.3	T 2.4	T 2.5	Average
Overall impression	5	5	8	8	7	8	6	6,7
U.F. Operators	7	6	7	9	7	8	8	7,4
U.F. Keyboard	9	9	9	8	8	8	8	8,4
Interface clarity	7	9	8	8	8	7	5	7,4
Calculation clarity	6	6,5	9	8	6	7	7	7,1
Functionality	7	9	8,5	7,5	7	7	8	7,7
Intuitiveness	8	8	7	9	9	7	10	8,2
Speed of input	5	4	7,5	8	6	6	4	5,8

*U.F. Equals user friendliness

The questions had the following answers:

1. Is the application intuitive?

An unanimous yes.

2. Is it functional?

Idem.

3. Would you like it if your students had access to this application at home?

This question turned more to the teach-philosophical question: Are technological shortcuts an enhancement to teaching?
And hence had a mixed answer of yes and no depending on the personal opinion on that matter.

Discussion.

*The first day needed some basic fixes before the application could truly function as it was meant to do. Hence the results of the first day will not be taken along the conclusion.

*Teachers are significantly older than the target group (VWO students). This gives them a larger understanding of why this application could be useful and more insight on what could be better but also makes them significantly less adaptive to modern technology. This makes Speed of input not an entirely reliable category as they are a slower group with cellphone technology than the target group.

*Since it is hard do estimate how much value a specific aspect contributes to the overall utility of the application the overall impression will be used to function as such.

*The marks were given by people with little to no experience with programming. They were given with a

standard of professional programmers in mind. Given that the developers of the application are not weakening the results validity.

Disclaimer The research conducted was a far cry from an objective double blind research and the test group was not random or entirely impartial. The study can hence only be used as a rough indication of client satisfaction and to indicate improvement areas of the application.

Conclusion.

The application did what it needed to do. It was very functional and intuitive and the user interface was easy to understand. The main focus points were input speed in comparison to writing and filling it in on the computer and the form of the output. The overall impression of the application was a 7,4 with a standard deviation of 0.89 which, given that the application was assessed as it would be assessed if it were made by professionals, is a result to be proud of.