

Math lectures done differently

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1. Introduction

Explain Everything is an easy-to-use application for screencasting and presenting in and out of the classroom. It lets you animate, record, annotate, and present ideas, knowledge and understanding. Explain Everything is available for all the major operating systems (for Windows, iOS, Mac OS X, and Android).

Professor Stephan van Gils used the Explain Everything (EE) application for the delivery of Math lectures during the 4th quartile of the academic year 2015-2016 for the 1st year students of Creative Technology and other programmes. Stephan van Gils used Explain Everything (EE) in combination with an iPad Pro and the Apple Pencil.

2. Why EE for education

Explain Everything can be used for educational purposes. These are the 2 main uses in our educational context:



- Flipping your classroom, by creating recordings of explanations of certain concepts (a so called pencast). For example on how to solve mathematical equations. Those recorded explanations can be shared as videos in a didactical format such as the "flipped classroom".
- Using the Explain Everything app on your tablet computer as an interactive whiteboard, within the lecture room. You can use it as an "writable" presentation. This is how Van Gils has used the application.

Other uses might be possible. What do you think?



3. Why a tablet computer might be better than a chalkboard

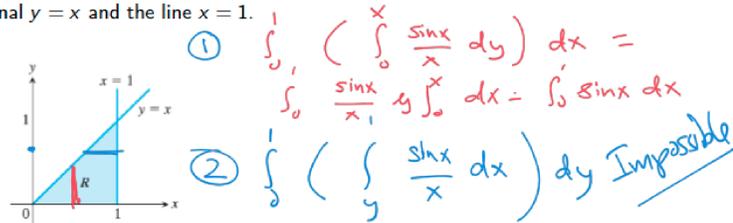
Lecturers often use the chalkboard to do calculations and explain derivations during lectures. This is completely natural to you and also to your students. But there are some drawbacks associated with this common practice.

First of all it is quite probable that another class will occupy the designated lecture hall before the Math lecture. Therefore preparing some calculations a chalkboard before a lecture is often logistically not really possible. And during the lecture itself in the lecture hall, the professor must be very aware of the readability of the handwriting. And thirdly the lecturer will be standing with his back to the students while writing. So really staying in touch with the students in the lecture hall is not easy.

4. What was the pilot about

The TELT team explored and tested different applications based on the requirements and advised Van Gils to use the application Explain Everything (EE). Furthermore we tested different connection types between the iPad and the beamer. For now we came to the conclusion that using a wired connection would be best.

Exercise Integrate the function $\frac{\sin x}{x}$ over the region R that is bounded by the x -axis, the diagonal $y = x$ and the line $x = 1$.



The order of integration does matter!

$$R = \{(x,y) \mid 0 \leq x \leq 1, 0 \leq y \leq x\}$$
$$R = \{(x,y) \mid 0 \leq y \leq 1, y \leq x \leq 1\}$$

There are a few separate steps that can be distinguished for using the iPad and EE properly. First Van Gils prepared his lecture slides. This can be done on any device or on the the iPad itself. Those slides can then be imported (in this case in PDF format) into Explain Everything on the iPad before the actual lecture. The import feature of EE is quite extensive. Files can be imported from different sources, such as Google Drive and Dropbox. And they can also be imported from SURFdrive. The slides were actually not the regular slides as the were used in previous runs of the course (see example above). They were specifically prepared for this purpose with quite some white space (see example above). During the lectures Van Gils wrote formulas, explanations and other important information on the white space on the slides. This was a very natural process for Van Gils, very much like teaching and explaining using a chalkboard.

5. Experiences

This pilot is experienced by Van Gils as very positive. These are the main positive points:

- The speed of teaching during the lecture while using the iPad Pro is very natural, just as during "regular" runs of the course.
- Using the app the lecturer can use several colors, which is not possible on a chalkboard.
- The lecturer can very easily add a slide during the lecture for additional explanations or examples.
- Enlarging the content on the slides is very easy to do (which is not possible on a chalkboard)
- The lecture is as interactive as needed (maybe even more then when using a chalk board)

The students involved were also quite in favor of this different way of teaching Math. They liked the lectures and the fact that modern technology is used to their advantage.

5. What's next

There are several lecturers that are using tablets in their classes, with a few different software applications.

The TELT team is investigating the (technical) solutions for using tablets as wireless presentation device.

Good to know: We have acquired a campus license for EE for a one year period. Please contact us in case you'd like to use this license.



For more information:
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