Using A Computer Screen as a Whiteboard
Abstract
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More than 25 years have elapsed since I last wrote on a board in front of students. I have developed techniques that allow me to create my lecture notes much more rapidly and vastly more clearly and fully than anyone could produce on a board or even an electronic board. Here are just a few of the advantages of this technique:

1

The process of teaching is relatively effortless. When I move from step to step, I can use drag and drop to produce a much more complete set of lecture notes than one can produce by writing.

2

the material is beautiful. For example, I can produce an effect like

$$\begin{aligned}\int_0^{\pi/3} x\cos x\,dx &= \int_0^{\pi/3} (x)\left(\frac{d}{dx}(-\sin x)\right)dx \\ &= \Big[(x)(-\sin x)\Big]_0^{\pi/3} - \int_0^{\pi/3}\left(\frac{d}{dx}x\right)((-\sin x))dx \\ &= -\frac{\pi}{2\sqrt{3}} - \int_0^{\pi/3}(1)((-\sin x))dx \\ &= -\frac{\pi}{2\sqrt{3}} + \frac{1}{2}\end{aligned}$$

3

I sit facing my students and have eye-to-eye contact with them all the time.

4

I can provide my students with complete and reliable lecture notes, this allowing them to give all their attention to the lecture instead of having to devote some of their efforts to the act of producing notes.

5

I can produce special effects such as font changes and color fields to make the notes more readable. For example, if I were to set out to prove the trigonometric identity

$$\sqrt{\frac{1-\cos\theta}{1+\cos\theta}} = \frac{|\sin\theta|}{1+\cos\theta}$$

I could begin with a side note like the following:

An important key to this problem is the fact that, if u is any given number, then $\sqrt{u^2} = |u|$.

For example, $\sqrt{3^2} = |3|$ and $\sqrt{(-3)^2} = \sqrt{9} = 3 = |-3|$.
With this key in mind, we should not be surprised to see absolute value signs on the the right side of this identity.

6

I can further reduce the amount of effort I have to put into the creation of my lecture by using the built in computer algebra system in my word processor.

7

I can prepare a skeleton document to fill in as I work in the classroom. Such a skeleton would also contain the exercises that I want to work through in my lecture. The use of a skeleton further reduces the effort of producing quality lecture notes in the classroom.

8

I can make a screen capture video recording to supply along with the lecture notes. Such a video recording gives students the option of revisiting the actual lecture in whole or in part.

The Purpose of This Talk

In this talk, I shall demonstrate my teaching technique, a technique I have conveyed to others in various parts of the USA (including the Federal Reserve Bank, Purdue University, MIT, and the Harvard University Business School), in the UK, in South Africa, in Thailand, in Singapore, in Malaysia, and in China.

If, on the basis of this talk, there is interest in a workshop, I shall provide such a workshop that will consist of several hands-on sessions during Fall 2018.