**What is being learned? What mathematics is the focus of the activity/technology? Is relational or instrumental understanding emphasized?**

This applet allows students to draw their own functions and see what the derivatives and integrals would look like. There are no equations involved, so students will focus entirely on the features of the graphs and how they relate to each other. The vertical stacking of the graphs allows students to compare what happens on each graph at the same x-value. Students will improve their relational understanding of graphs of functions and their derivatives.

**How does learning take place? What are the underlying assumptions (explicit or implicit) about the nature of learning?**

Learning takes place through exploration and possibly play. Students can discover which features on a graph create certain features on the derivative or integral graph. They can, and will, make conjectures and test them as they draw their curves.

**What role does technology play? What advantages or disadvantages does the technology hold for this role? What unique contribution does the technology make in facilitating learning?**

The technology provides us a way to represent mathematical ideas, and a way to simplify a common curriculum activity. First, the Calculus Grapher allows us to represent derivatives and integrals in a graphical way. Second, it is a common activity to have students choose a function, find the derivative, graph both functions and then compare them. This applet allows us to skip straight to the graphical comparison, without the extra steps of working with the functions and drawing the graphs.

**How does it fit within existing school curriculum? (e.g., is it intended to supplement or supplant existing curriculum? Is it intended to enhance the learning of something already central to the curriculum or some new set of understandings or competencies?)**

This activity would nicely supplement students’ study of derivatives from a graphical standpoint. Using the graphs of functions or their derivatives is a useful tool, and students who have a strong understanding of the characteristics of the graphs usually fare much better.

**How does the technology fit or interact with the social context of learning? (e.g., Are computers used by individuals or groups? Does the technology/activity support collaboration or individual work? What sorts of interaction does the technology facilitate or hinder?)**

This tool lends itself to partnered exploration well, but because only one person can manipulate the graph at a time, I wouldn’t put more than 2 people on a computer. Students could have great conversations about what they expect the derivative to look like, and why.

**How are important differences among learners taken into account?**

This is an excellent tool for students who aren’t as comfortable with formal mathematical notation, since they can come to an understanding of the relationship between function and derivative without working with the equations themselves. It is also good for active, social and visual learners.

**What do teachers and learners need to know? What demands are placed on teachers and other "users"? What knowledge is needed? What knowledge supports does the innovation provide (e.g., skills in using particular kinds of technology)?**

Teachers need to know if the school computers meet the software requirements before trying to use this applet in class. Both students and teachers need to know that each graph must be zoomed individually – zooming in on one graph does not zoom in on another. Otherwise, the tool is pretty intuitive.