



SOCIETY FOR TECHNICAL COMMUNICATION

The Technical Communication Summit

STC's 54th Annual Conference

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What is Accessible, Usable On–line Instruction?

An IDL Progression on NSF–Funded Research:

An Accessible On–line Resource for Mathematics Students & Instructors

Dr. Gloria A. Reece (Dr. Glo), Milledgeville, GA

Session Inquiry Questions:

Inquiry Question for Mathematics Instructors:

How can we reconstruct our current website, “Demos with Positive Impact” so that they are accessible and usable for those with vision and hearing problems?

Inquiry Question for Communicators:

How can we apply this research to our work as communicators, educators, graphic artists, web designers, and technical illustrators?

NSF Project Abstract:

Investigators

Lila F. Roberts (PI), Georgia College & State University

Expertise: Mathematics (calculus content expert), On–line Math Demos (teaching website <http://mathdemos.gcsu.edu/mathdemos/index.html>), Curriculum Proposal Development (for funding opportunities CCLI–EMD DUE–9952306).

Gloria A. Reece (Co–PI), Georgia College & State University

Expertise: Instructional Technology and Curriculum Development (includes differentiated instruction), Technology Integration (teaching, learning, and assessment), On–line Teaching and Learning Communities, New Media Product Development, Accessible Design, Usability Testing, Research in Vision, Hearing, Mobility, and Internet Access (includes needs analysis and navigation aids for wayfinding and digital communication devices for physical settings in collaboration with vision, hearing, and mobility constituencies), On–line Course Casting, Proposal Development for Industry and Funding Opportunities (Technical, Marketing, Education (includes Curriculum)), Educational Research (principal investigator for a large low vision study in 2002).

Interdisciplinary Collaboration: Dave Hill, Temple University

Expertise: Mathematics (algebra content expert), On–line Math Demos (teaching website

<http://mathdemos.gcsu.edu/mathdemos/index.html>), Curriculum Proposal Development (for funding opportunities CCLI–EMD DUE–9952306).

Relevance/Value

A proposal was funded for \$75K. Only 11% of NSF awards were funded for the 2004–2005 academic year. This grant is for a modification of an existing collection of math resources, “Demos with Positive Impact” so that they are accessible for people who have vision and hearing problems. (See website scheduled for a makeover at this location:

<http://mathdemos.gcsu.edu/mathdemos/index.html>). This two–year research project began in January 2006.

Project Abstract

In this project, we extend the work on mathematical demos and adapt them for multimedia so that the mathematical concepts are accessible to students with vision and hearing problems. The intellectual merit of the activity lies in its use of a well–recognized and established collection of resources, "Demos with Positive Impact" (CCLI–EMD DUE–9952306) as the source material for adaptation. Major components include adapting existing animations for captioning and audio; addressing issues of text legibility for display of mathematical symbols; and adapting existing web pages for more effective use with screen readers. This work also builds on Dr. Reece’s dissertation work: *Text Legibility for Web Documents and Low Vision*, which was a collaborative effort with vision constituencies in the Memphis, TN area. The project is also having a broad impact by enabling the target audience to have access to previously unavailable high–quality multimedia demonstrations.

Detailed Session Plan:

By the end of each progression segment, each attendee will be able to accomplish objectives in seven instructional domains:

1. **Recognize** a math animation.
2. **Describe** an animation suitable for a college calculus class.
3. **Interpret** the qualities of a math animation that might also be suitable for a technical illustration or graphic design element of a publication (on–line or paper).
4. **Practice** strategies for a basic animation with a paper and pencil activity.
 - a. *What ideas are there for animations?*
 - Snowflakes—any shape or size
 - Gumballs—any color
 - Coconuts
 - Puffs of smoke from a witch’s brew
 - A swarm of bees
 - Meteors and craters
 - Under the bed monster eyes!
 - Balls—basketballs, huge gigantic ping pong balls, bowling balls, footballs, etc.
 - \$1,150.00 karat diamond
 - Just wheels,
 - Pompoms
 - And lots more!
 - b. *How big will the animation be?*
 - c. *How many moves will it take?*

- d. *What moves will it take?* (Learn how to do singles, stacks, chains, dogpiles, and use half-dones.)
- e. *How do I know if my animation is correct?*
5. **Select** animations that might be appropriate for graphic design or technical illustrations.
6. **Write** a statement that describes an animation.
7. **Compare** animations.
8. **Share** creative animations!
9. **Discuss** accessible, usable design options.

Sources Cited:

<http://mathdemos.gcsu.edu/mathdemos/index.html>

<http://www.mathdemos.gcsu.edu/accessiblemath/index.html>

Materials for Hands-On Activities:

A sketch pad

A gel pen in three different colors

Scissors

Thin markers for illustration

Crayons for highlighting the animation or making a two-layer animation for a high contrast design

A geometric template

Optional Materials (may be provided by attendees):

A battery-powered laptop (any platform) with attendee-provided Internet access

[Note: If you are attending the progression in this mode, please have your system ready to go before the topic begins.]

Microsoft Excel

Web Browser

Additional Information

E-mail **Dr. Glo** at drgreece@alltel.net that asks for additional information and updates on new websites associated with this work.

About the Presenter

Dr. Glo provides **exceptional technology solutions** for **portable media** and **on-line course casting**. Gloria is an internationally recognized expert in accessible, usable design. She led a national, collaborative research campaign on accessible new media and hearing loss for the STC's AccessAbility SIG in 2002. Gloria is a co-recipient of a 2005 National Science Foundation grant that explores accessible on-line resources for mathematics. Gloria was principal investigator for "*Text Legibility for Web Documents and Low Vision*" in 2002. She has been developing websites since the mid 1990's.