

Position Paper for eBooks: Great Expectations for Web Standards

Submitted by: Cengage Learning

Contact: Bernard Grunow (bernard.grunow@cengage.com; 248.866.8464 (m))

Participant's Interest

Cengage Learning is an academic publisher engaged in transitioning its business from primarily print to primarily digital. For much of our content, the transition is comparatively easy. However, rendering math appropriately when your audience doesn't yet know the subject matter poses many and varied challenges. In particular, addressing the needs of "math phobic" students in developmental math courses is a great area of focus. In print, precise positioning of related elements in multi-step equations, the use of color to provide annotations and highlight key concepts (as well as other pedagogical devices) are valuable tools in the education process.

Point of View

Cengage chose MathML for rendering math because it is a W3C standard and for its inherent ability to make math content accessible to users with disabilities. Additionally, because the content is captured in markup and not as an image, users can interact with it in more productive ways.

However, tools for creating MathML "visually" are few, and none that we have found provide the ability to create precise markup and then translate it faithfully and completely to MathML. The tool of choice by many of our conversion vendors permits markup, particularly of complex equations, using templates, menus, buttons, etc., to make the process easier. But sophisticated markup using color, precise alignment, etc., to assist in understanding key concepts is lost in the conversion to MathML.

Further, the tools we've examined to render MathML are less than ideal in bringing the markup to users' screens with 100% fidelity. Rendering complex math content is tough enough in one browser without having to deal with cross-browser compatibility issues and browsers are very uneven in their native support for MathML. SVG is a logical alternative, but on-the-fly creation of SVG images from MathML is resource-intensive and has some negative downstream consequences.

As we're just getting off the ground with this work, we may discover other challenges in these areas, or in other areas that we have yet to explore.

Participant's Offer

We offer to describe our experience in working with math content end-to-end, from content capture to content rendering, describing the challenges we encountered and demonstrating what we are endeavoring to do to overcome them.

We'd like to take advantage of this forum to engage with fellow attendees, including browser developers (Google, Microsoft, Mozilla, etc.), to determine how we can evolve associated tools and W3C standards to support fully the MathML standard -- including full integration with the DOM, CSS, selection and highlighting -- and the rock-solid reliability of display that is required for this highly-formatted content. As noted previously, one of many bright spots with MathML is its ability to support accessibility, another hot button within academia. As browsers move toward more native support, they'll need to ensure that these capabilities are at least preserved, if not enhanced.