Using Technology to Scaffold the Integration of Content and Epistemic Knowledge in Order to Support Socioscientific Reasoning
(Poster)

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Abstract

Socioscientific reasoning (SSR) describes a set of practices needed for inquiry and decision-making in controversial social science-related issues, known as socioscientific issues (SSI) (Sadler, Barab & Scott (2007). Sadler et al (2007) identified four aspects of SSR: (1) recognizing the inherent *complexity* of SSI, (2) analyzing SSI from *multiple perspectives*, (3) appreciating the need for *ongoing inquiry* relative to SSI, and (4) employing *skepticism* about potentially biased information. Thus, SSR requires both integrating scientific knowledge and epistemic thinking. Despite the growing body of knowledge regarding SSR, many challenges for its development have been raised (Romine, Sadler & Kinslow, 2016).

Research has shown that instruction based on the knowledge integration (KI) framework, using the Web-based Inquiry Science Environment (WISE) can help students develop and integrate scientific knowledge and improve transfer of knowledge to different contexts (Chiu & Linn, 2011; Roseman, Linn & Koppal, 2008). Additionally, WISE, as an authoring environment, enables designers to embed digital scaffolds for knowledge integration as well as epistemological prompts. The latter can contribute to student understanding of the nature of science (Linn, Clark & slotta, 2002), and are specifically relevant for students' development of SSR. This research examined the effect of features we designed to elaborate the KI processes, in order to enhance their support for students' SSR.

We used an existing WISE module, dealing with the socioscientific issue of 'Asthma in the community' (Tate et al., 2008). In order to enhance the integration of socioscientific reasoning among students, we redesigned the module and implemented the modified KI processes in the unit during three successive iterations of a design based research (DBR) study with four 8th grade classes. The elaboration of each of the four KI processes in light of SSR development will be presented in the poster. We examined students' integrated understanding of the scientific aspects of the asthma phenomenon and their socioscientific reasoning before and after the intervention.

Findings from three successive iterations revealed that students significantly improved their integrated understanding of most tested aspects of the asthma phenomenon within each iteration. Preliminary findings indicate improvement in students' scientific knowledge between iterations. The potential of the SSR-modified KI processes to support the development of various aspects of socioscientific reasoning is reflected in observations and student interviews. Our poster will present more established results and will discuss the

elaboration of each of the four KI processes and their potential to address SSR development.

Keywords: socioscientific issues, socioscientific reasoning, knowledge integration (KI), epistemological prompts.

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