Digital support for inquiry, collaboration, and reflection on socio-scientific debates- CoReflect 2

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The ability to make informed decisions on socio-scientific issues, grounded on scientific evidence, appears a fundamental attribute not only for scientific literate people but also for democratic citizens. However, the development of this skill is not straightforward (Lee, 2007). Engagement in group discussions with some teacher intervention has proved not to be an adequate condition for promoting advanced decision making skills (Ratcliffe, 1997).
In the present work, we have developed a web-based learning environment based on argumentation to support the development of decision making skills. We've draw on interventions that proved effective in promoting students' argumentation skills – production of Counterarguments and Rebuttals - on science and social issues (Kuhn et al, 2008, Iordanou, submitted). Usage of Counterargments involves the ability to critically evaluate a position; an ability which lies at the heart of decision making and distinguishes effective decision makers from less effective ones (Ratcliffe, 1997).

We have developed a sequence of activities on the topic of Global Warming, that will take place in 4 stages. In the first two stages students through inquiry activities will acquire a conceptual understanding of the Greenhouse effect and will examine some of the phenomena that concern us, such as the ice melting. In the third stage students will engage in argumentive activities in an effort to examine whether Global Warming is manmade or natural. While collaborating in pairs, students will participate in a sequence of debates with pairs who hold contrasting positions on the topic. This stage will also include scaffolding activities for supporting the development of students' argumentation skills and in particular the incorporation of scientific data and evidence in students' arguments. In the fourth stage, through scaffolding students will be encouraged to consider the arguments they have developed and the scientific evidence they have examined, for making decisions. Research has shown that personal and vicarious experience is probably more influential in decision making than abstract statistical evidence (Marx et al, 2007), thus students will be supported to use the argumentation skills they have developed in the third stage for the decision making process. Also, some additional information regarding the politico-economic aspect of Global Warming will be introduced in the fourth stage.

Through pre-post assessments we will examine whether an intervention based on inquiry, argumentation and reflection can promote students' (a) conceptual understanding, (b) argumentation skills and (c) decision making skills on a socio-scientific topic.

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