Exploring web design principles for joint meaning-making in health-related issues

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Abstract
Beginning with an overview of different aspects of scientific literacy in relation to an expanding media landscape, this poster proposes a broader definition of the concept of scientific literacy, also including scientific media literacy. The aim of the poster is to formulate and test a number of design principles for creating meaningful online learning situations in science education relating to health-related issues. The principles are characterized by collaborative problem-solving, informal mentorship, online interactions and working with as authentic and up to date topics as possible, e.g. socio-scientific issues. Through the joint creation of a web-based platform for participation in health-related reasoning, both Swedish upper secondary students and their science teachers are involved in the meaning-making process. Data will consist of audio recordings of students’ reasoning during media production, uploads on the website (e.g. texts, images and wiki-threads) dealing with health-related dilemmas. The results from a pilot study will be presented and discussed, focusing on an evaluation of the design principles.

Key Words
scientific media literacy, socio scientific issues, health education, media production, participation

1. Towards scientific media literacy

1.1. Background
In a world full of ever-changing technologies and constant flow of information on integractive digital platforms, the border between the producer and the consumer of a mediated message is becoming increasingly blurred (Jenkins, Purushotma, Clinton, K, Weigel & Robison, 2007). Bringing digital technologies that holds pace with the rapidly changing media landscape into a school context highlights new dimensions of science education. The digital era opens up possibilities for participation, involvement and civic engagement in a democratic society (Roth & Lee, 2003), but also challenges in terms of how to best access and navigate in the
vast media landscape (McClune & Jarman, 2012; Buckingham, 2006). Multiplied possibilities to argue back and respond to mediated messages create new arenas for position-and decision-making (Kress & Selander, 2012; Klosterman, Sadler & Brown, 2012). It has been suggested that science education must prepare our students for these circumstances and thereby contribute to the public understanding of science in media. A greater emphasis on media awareness require science teachers to embrace a wider range of curricular goals (McClune & Jarman, 2012).

1.2. Scientific media literacy through participation
Roth and Lee (2003) describe SL as emerging from students’ interaction and participation in collective praxises dealing with issues with immediate concern to their own lives, e.g. socio-scientific issues (SSI). SSI are characterized by connection to lifestyle, lack of definite answers and element of risk-assessment (Ratcliffe & Grace, 2003). McKenzie (2006) suggests that SL in relation to media literacy might be understood in terms of participation in web-based communities. To access media and to become active producers on social networks, e.g. science-related wikis, students not only have to understand the related scientific concepts, but also develop some of the critical, social and cultural competences that may be associated with meaningful participation (Jenkins et al., 2007). This implies a shift of focus from individual scientific skills and literacy to expressions of common involvement.

Limited research has been conducted on how and to what extent digital media can be potential sources and platforms for learning, and social connectedness (Kress & Selander, 2012; McKenzie, 2006). Klosterman et al.’s, (2012) review on earlier studies on the use of media in science education shows that the tasks students are given most likely focus on analyses of printed media, rather than giving students opportunities to access, evaluate and produce digital media themselves. Lundström (2012) claims that media does play an important role in young people’s lives when it comes to decision-making in health-related questions and that such issues should to a further extent be incorporated in science education. This raises new questions about in what way media production in science education can contribute to make students meaningfully participate in e.g online forums (Klosterman et al., 2012).

1.3. Purpose of the study
The purpose of this study is to formulate and evaluate design principles in order to develop education for scientific media literacy. The study strives to highlight and integrate new aspects of scientific literacy by investigating the relationship between dimensions of ‘using’ media as well as ‘doing’ media. Through the joint creation of a web-based platform for students’ participation in health-related decision-making, both students and teachers are involved in the meaning-making process.
1.3.1. Research questions

- How can participation in media production be understood as an aspect of scientific literacy?
- In what ways can specific design principles enable students’ participation in online communities in science education?

2. Method

The study is designed to explore ways of understanding and supporting collective reasoning, critical skills and joint meaning-making in health-related issues. A design-experiment is in the planning and will be conducted at a public high school in Sweden in the beginning of 2015. The school, with approximately 500 students attending three different programs, focuses on social and ecological issues in relation to education for sustainable development. While media education is not the sole focus of any of the programs, it is a central part of everyday practice e.g. through various web-based projects. Data will be collected from 128 students aged 16-17 years, equally divided into two classes from the natural science program and two classes from the social science program.

The education sequence is designed in close cooperation with two science teachers at the school, and the outcome will be a part of their regular biology and natural science curriculum during six lessons per class. Inspired by Jenkins et al.’s, (2007) definition of a participatory culture, a number of design principles have been set to serve as a guide line for the planning process (The Design-Based Research Collective, 2003). The design is characterized by:

1. Dealing with issues that have a strong connection to students’ everyday life and promoting civic engagement.
2. Collaborative problem-solving.
3. Promoting students’ access, analysis, evaluation and creation of media.
4. Online interactions and low barriers to communication.
5. Informal mentorship where knowledge can be shared, spread and pooled.

A web platform using Google sites will be created by the teachers, and students’ instructions as well as assessment criteria will be formulated. Further, the platform will serve as a tool for student media production and critical engagement with health-related science in the news. The students will be divided into project groups of 5-6 students, working with one of the following health-related topics; vaccinations, antibiotics, cancer, lifestyle diseases, sexually transmitted diseases and drugs. Each group will be responsible for uploading a text-, image- and/or video presentation of a health-related ethical dilemma connected to their health topic. The work in progress will be documented as audio-recorded discussions during lessons and the final result at the website will be analyzed. Student’s evaluation of sources of information and joint meaning-making of science-related concepts will additionally be documented and followed on wikis, where students posts threads in order to initiate a debate on their dilemma.
and to respond to the comments of other students. The website and the audio-recordings might be complemented with semi-structured interviews. Due to the explorative nature of the study, data collection and analysis are flexible. However, a small-scale pilot study has been planned for, and will be carried out with 64 students from the natural science program at the same school, in February-March 2014. The purpose of the pilot study is to fine tune or re-design students’ instructions, the web platform and the methods for documentation.

3. Results

Since this is work in progress and the pilot study has not yet been conducted a presentation of results is not possible. However, by the time for the NFSUN symposium in spring 2014 parts of the pilot study will be analyzed, and might serve as an indicator for the main study in 2015. The audio recordings will be transcribed and analyzed together with threads posted on the wikis. For the analysis, a combination of already existing frameworks will probably be useful. For example, in order to show the extent to which individual arguments become part of the collective reasoning, a useful tool of analysis might be the ‘interactional reasoning framework’ presented by Morin et al. (2013). The framework combines Mercer’s (2000) categorisation of discourse types and Habermas’ (1987) worlds of validity, and was created to analyse students’ joint meaning-making in science related topics on wikis.

4. Discussion and conclusions

The poster will share and discuss some of the results and conclusions from the pilot study. The main focus of the discussion will be an evaluation of the design principles and in what way they might (or might not) support a participatory culture that allows for students joint meaning making in health related issues.

5. References


