Teaching and Studying Environmental Issues on the Web in ENO Environment Online

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Environment Online (ENO) is an international web-based environmental education and research project, coordinated from EnO, Finland. ENO project is based on the Global Learning and Observations to Benefit the Environment programme (GLOBE). Environment Online participants represent a diverse group of young people from every continent. ENO was launched in 2000 with the goal to establish an environmental education and research learning community. Environment Online project coincides with the concept of education for sustainability. It is a global virtual school where environmental experiences and data collected by students is shared among participants. ENO is a flexible learning environment but at the same time it's like a school with specific environmental themes and virtual classes for learning. In this article the results and achievements of the first year of Environment Online are discussed. Furthermore guidelines for assessing the quality of e-learning during virtual classes are illustrated.

Keywords: e-learning, sustainability, web-based learning environment
1 An introduction to ENO Environment Online

Environment Online (ENO) is an international web-based environmental research and education project, coordinated from Eno, Finland. ENO project is based on more commonly known larger-scale international project, the Global Learning and Observations to Benefit the Environment program (GLOBE). The GLOBE program was launched in 1993, and it involves 5–18-year-old students in schools throughout the world (Kaivola & Masalin 2000). In addition, there are almost 12,000 teachers educated for GLOBE around the world including about 300 from Finland. GLOBE students and teachers make environmental observations and hands-on measurements near their school on a regular basis. The student-collected data are transmitted to a central data-processing facility via the Internet and is available at the GLOBE web site (GLOBE 2000; Kaivola 2000; Means & Coleman 2000; GLOBE 2002).

The scientific background of ENO Environment Online is based mostly on GLOBE activities, but puts more emphasis on cultural and social environment and project type of working than GLOBE does. It is also a much more smaller-scale project than GLOBE engaging the participants with more time taking activities included in curricula of regular classes. ENO was launched in the summer of 2000 with the goal to establish an international environmental education and research learning community. Environment Online project coincides with the concept of education for sustainability and ecological citizenship (Hassard & Weisberg 1999; Huckle 2001). It is a global virtual school where environmental data gathered by students is shared with participants in the same ways as in GLOBE. ENO is a flexible learning environment but at the same time it’s like a traditional school with specific environmental themes and timetable for learning. Teachers and students all over the world are making up a web community of their own in the project. (ENO 2002; Masalin 2001; Vanhanen 2000; 2001a; 2001b; 2002)

The objectives and agenda of ENO

The objectives of ENO were designed to promote collaborative learning in a web community (e.g. Vahtivuori & Masalin 2000), to explore new learning skills in ICT, to deepen environmental themes in education and to foster global awareness and sustainable living. In order to meet these aspirations, schools from developing countries were actively asked to participate in the project. ENO unites schools to learn interactively together despite different locations, cultural differences or prosperity, as a one-web community (ENO 2002; Vanhanen 2001a; 2001b; 2002). The age structure of participating students is from 12-year-olds to 18-year-olds. The total number of participants is 1100 people with 907 students and 200 teachers. There are a total of 50 official ENO schools from 30 countries involved.

Four major environmental themes are studied within each ENO school year: The Place We Live in (physical and social environment), This Is Our Life Style (cultural environment), This Is Our Earth (physical environment and global education) and The Way We Lead Our Lives (education for sustainability). During each theme period virtual lessons are arranged in the form of chats, questionnaires and quizzes. Pre and after lessons activities are involving students to share ideas, monitor their own environment, collect different kinds of data and reflect on what has learnt. There is also an action week engaging students to do scientific and cultural research in their own surroundings, to explore different ways of sustainable living and implement the use of learning diaries and other kinds of student centred activities in ordinary classes too (Kaivola 2002).

The web site includes a forum for students and teachers to communicate with other ENO schools around the world, leaving "media trails", creating and strengthening alliances among students, and increasing not only their environmental understanding but also their understanding of other cultures and their sense of the world as a global community. Technology facilitates the learning by forming an interactive learning community where participants share their knowledge and ideas, whereas students learn mainly through technology.

Evaluation and further research of ENO

During its first two years of action, ENO received a remarkable amount of support and success in form of publicity, donations and international awards (ENO 2002).

ENO succeeded in engaging teachers and students with environmental
discussions on a regular basis especially well during virtual lessons hosted by different teachers. According to feedback and seasonal assessments provided by the program, virtual lessons based on synchronized chats were the most appreciated ENO learning environments by students. But were the educational goals of virtual lessons achieved? What did the students learn and how did they use this particular type of web tool to build knowledge and share experiences? How constructive was the role of teachers as chat hosts?

To explore these kinds of questions a research project was set up as part of a larger ongoing evaluative research of ENO. The objectives of this project are
- To find out, what kind of interface happens during chats in the ENO Environment Online context
- To evaluate the quality of environmental and geographical e-learning outcomes
- To develop and apply educational practices, which support high quality teaching and learning processes by combining IT technology, based learning platforms and face-to-face classroom lessons (Kaivola, Åhlberg & Masalin 2002).

For this paper only one selected chat session of ENO was analysed. General outlines of the case are highlighted in order to find out, what kind of interface happened during the chat and what were the contents of lines written.

2 ITC and virtual lessons

Communal learning in a web based learning environment is a key didactic approach in ENO. ENO students’ use of collaborative and communal inquiry based learning experiences, which involves use of state-of-the-art communications technologies, forms the basis of the ENO. Furthermore, the ENO web site can be seen as the main nexus of the ENO. All the information and data go through the site, and it acts as a communication medium for the whole ENO community. Environment Online utilizes the latest ICT and groupware applications to create a communal learning environment. Interactive chat, asynchronous discussion and video chat are the tools used for communication within
Table 1. The frequency, direction and general contents of the lines in the selected chat session of ENO.

The majority of the interface during the chat consisted of students talking to each other or in general to everyone (33%) and teachers talking to students (35%). Students used all most half (38%) of all their lines for casual chatting, while teachers concentrated on commenting, asking questions and answering them. However, casual chatting was popular among teachers (22%) as well. Lines dealing with guidance and management appeared less often as one could expect. The same phenomenon happened with nonsense talk. These two types of contents together were represented only 5% of all lines.

Figure 1. The direction of interface and frequency of lines during a selected ENO chat session.

The chat was analysed also from the viewpoint of time spending. The session was divided into periods of 15 minutes (Figure 1). During the first hour of the chat lesson, students played an active role as participants. They spent most of their time by introducing themselves and finding out, who are online. Teachers’ task was to trying to keep students focused on the topics by reminding them of the agenda:

[02:21 AM Kieren McDonald 8B]: Welcome everyone. Today I think we are discussing sustainable resources. I hope we'll all get something out of this.
Also guidance was necessary:

[02:23 AM Kieren McDonald 8B]: Stop saying hello. It is inappropriate and clogs the archives. Remember that everything we say is recorded for everyone to see.

During the last part of the chat session the participants started to concentrate on subject matter. For about a half an hour there were several student engaged with a serious discussion about environmental issues concerning fresh water, wastewater treatment and contamination of beaches:

[03:26 AM Allison]: How is water contaminated in your environment?
[03:33 AM Kim]: Is the water quality in Sri Lanka the same as Australia's or is it better or worse

There were two to four teachers actively talking to students, sometimes lecturing but mostly facilitating the collaboration. The most dominating of them was the nominated chat host. There was also a professor of geography following and commenting the chat for some time during the last hour.

However, students, who were not fully engaged with the topics, often intruded on the knowledge building discussion. They were making casual comments and inappropriate questions. Also due to the character of chat environment, the connection between answers and questions asked many lines ago was hard to follow. Especially fragmental were cases, in which students were asking personal questions from teachers, like in the following example:

[03:39 AM Shan Haines]: If you are busy Neil and want to leave just let us know - we have this lesson until 11.50 our time
[03:39 AM Kieren]: In that case what would they do?
[03:39 AM neil byron]: I have lived in Melbourne for 2 years now.
[03:39 AM Allison]: That would be pretty bad Dr. Byron
[03:40 AM Kim]: how old are you?
[03:40 AM neil byron]: I miss living in the tropics!
[03:40 AM Allison]: I mean with the water in England
[03:40 AM Aaron 8B]: I have lived in Ipswich all my life.
[03:40 AM neil byron]: 50

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[03:40 AM Kim]: That was Hao's fault, SORRY!!!!!!!!!!!
[03:40 AM Shan Haines]: Dr Byron is young as I am
[03:40 AM Kieren]: would say that the pacific islands wouldn't fare too well because
[03:40 AM Aaron 8B]: I'm 13, der
[03:41 AM HAO]: yeah Ms Haines

At the very end of the chat the teachers spent time to evaluate the session. They were sharing their experiences and exploring ways to improve the quality of e-learning in Eno context:

[04:07 AM Shan Haines]: I suppose its better for the kids to focus on issues that are around them - my kids were interested in water use, we had explored the idea of water as a source of conflict in the future
[04:08 AM Shan Haines]: That will be after school for us
[04:08 AM Kirk Bergen]: Yes, we are studying water now. Sustainable development to them in 6th grade at age 11-12 can only be at a very basic level.
[04:09 AM Shan Haines]: My students have done some brochures on water conservation and water use I may put some of them in the materials section
[04:10 AM Kirk Bergen]: Shan, it has been great sharing more with you here today. It would be nice to hook our students up in the future on a school to school discussion.
[04:10 AM Kirk Bergen]: I'll send an e-mail detailing more specifics later in the week.
[04:10 AM Kirk Bergen]: Sound okay?
[04:11 AM Shan Haines]: yes it has been great as well hope we can share more, this is what I like about this project

3 Recommendations and conclusions

In the light of this chat it seemed obvious that the students needed a warm up - period of casual chatting in the beginning of the session to feel comfortable with the social climate of the virtual classroom and
the chat tool. Each time a group of students entered the chat room new hellos and introductions were changed. Popping in the ongoing discussion with greetings makes it difficult for the other participants to keep on concentrating on the topics. Making the sessions a bit shorter so that each class could stay online from the beginning to the end can minimize this confusion.

The role of teachers as facilitators and participants in the discussion was surprisingly active. They really seemed to enjoy changing their own experiences in the environment and views of sustainable living with the students and colleagues online. Nevertheless, also they had sometimes difficulties in sticking with the subject matter. The role of the chat host as a guide of all the participants is there fore utmost important in order to maintain the structure and contents of the chat under the current theme. Setting up an explicit goal and in this case especially a more specified environmental problem to be scrutinised during the chat session is strongly recommended.

As a conclusion, in the light of this ENO case, guided chats can be an effective tool when building collaborative learning communities. However, pre and after chat session activities in the classrooms and outdoors play an extremely important role while the quality of e-learning is evaluated. In further research this field of ENO is also going to be evaluated.

References

Temptations of the Web: Estonian Science Student Teachers Reflect on their Relationship With the Internet

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The Estonian government strongly supports educational uses of the Internet by the Tiger Leap Programme. So there has been an administrative push to use the Internet even if teachers have only a short or limited experience of it. The aim of this study was to find out what kind of opportunities, challenges and problems Estonian science student teachers saw in the educational uses of the Internet. The answers were obtained by questionnaire in 2001 from 45 students at the university of Tartu. The questions were focused so that the student teachers considered themselves as forthcoming teachers as well as putting themselves in the shoes of their future pupils. Also student teachers’ emotional attitudes towards the Internet and their views about the adoption of the Internet as an innovation were asked. The student teachers believed is positive consequences for themselves and for their pupils when using the Internet. They did not expect to have any serious problems from it. They liked the Internet and wanted to find something interesting about it. When judging their own