Genetically modified anopheles parasites

An article from the local newspaper tells us that American researchers have now developed a genetically modified anopheles parasite. When ten participants subject to an experiment, were bitten by mosquitoes carrying these genetically modified anopheles parasites, all ten avoided illness and also developed a strong immune system against malaria. https://www.svtnyheter.se/2017-01-04/genmanipulerade-myggor-kan-bota-malaria **Perhaps this is the solution for people dying and suffering under malaria. If people just release lots of these mosquitoes carrying these genetically modified anopheles parasites in countries dealing with malaria problems, they will get rid of the problem?**

What the 24 pupils aged 13 think about that:

- If you release the mosquitoes, people cannot give up a vaccine.

- Malaria may be part of evolution. Then it's good that people die because we are so many people on earth.

- What kind of people participated in testing the vaccine? Men only? Americans only? Adults only?

- If a country chooses to release mosquitoes with the genetically modified malaria parasites, then a neighboring country, despite democracy, cannot stop the mosquitoes in their country! Even if the people vote against the country letting out these mosquitoes. The mosquitoes do not take national borders into account but fly to the neighboring country without asking!

- What happens when a different organism (the genetically modified anopheles parasite) comes into nature?

- People come down with something that might be worse?

- It could be tough with all mosquitoes! You're left with de usual ones and on top of that the ones the scientists plant!

- Why has man not found a cure yet?

- Parasites may change (mutate) into something else, something more dangerous.

- Suggestions were made that death sentenced or those with suicidal tendencies should be subject to experiments.

- The planted mosquitoes may affect animals? Both when they bite and when animals eat the mosquitoes with the genetically modified parasites.

- If the vaccine is in syringes instead of in released mosquitoes , maybe people may earn more money.

- It may be expensive with malaria vaccine?

Time table:

50 minutes	First the students read the article individually and then the teacher read the article aloud; the students created a list of important concepts and formulated questions to the text in order to understand its contents.
30 minutes	Review of Malaria based on student questions.
60 minutes	Review of genetics based on student questions.
60 minutes x 2	Half-class conversation/ discussion for or against using mosquitoes with genetically modified anopheles parasites.

The purpose of the task was to use SSI to raise the students' interest and motivate them to expand their knowledge of genetic engineering, diseases, vaccine and ecology. The aim being to create a situation where the students were ready to show their skills by talking, asking questions, discussing in order to broaden and deepen the conversation based on the given subject. The students were also expected to find arguments, take a stand and weigh the pros and cons.

Evaluation:

The structure succeeded to capture many of the students' interests: The students were eager to ask questions to the text and to learn further about genetics and malaria during the subsequent lessons. The students became involved in life and illness issues: "Imagine that people can die so easily just because they live in an African country and not like us in Sweden!" I have previously worked with half-class discussions and conversations and it has always been successful. But starting with a newspaper article where the content was new to and relatively difficult for the students was a new but successful approach. It gave a new intensity and sharpness to the conversation. The thorough work on the text with concepts and questions made it possible for many students to succeed. The students were well prepared for the conversation/ discussions the last lesson; everyone had understood the contents of the article. Together they were able to weigh the advantages against the disadvantages. Everyone could take a stand on the question. There were two nice moments in the two half classes!

It was clear that the students without any guidance came under the three headings that characterize SSI: Economy, Ecology and Ethics. A development opportunity for me in my teaching profession is to make similar SSI in collaboration with a teacher in social studies (Religion, History, Geography and Civics), as it turns out to be natural for students to formulate questions and thoughts that also appeal to these subjects.

Sara Lilja, Malmö University, Teacher at Malmö Stad, Sweden, sara.lilja@malmo.se

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