Imagine... sharing ideas in the life sciences

With the help of enthusiastic school students and scientists, the Dutch school competition 'Imagine' supports the sustainable production of biodiesel in Mozambique, avocado oil in Kenya and the colorant byxine in Surinam. **Daan Schuurbiers** and **Marije Blomjous**, from the Foundation Imagine Life Sciences, explain what Imagine is all about.

'Advancing sustainable development by connecting life-science research and education' is the ambitious idea behind the Imagine school competition organised in the Netherlands. The idea is quite simple: life scientists are invited to submit proposals for the application of a technology in a less-developed country. Groups of school students aged 16-18 then turn these scientific proposals into business plans during a national school competition. The finalists present their business plans before a professional audience at an international conference. In the end, only one group wins the competition's grand prize: the realisation of their business plan and a visit to the country where the project will be carried out.

Life scientists have contributed a wealth of innovative applications of life-sciences research for the benefit of developing countries, such as using fungi to attack malaria-carrying mosquitoes, biological soil fortification or wastewater treatment through nanofiltration. Deriving practical, low-cost applications from fundamental laboratory research is not self-evident, but scientists see the challenge in putting their research to practical use. According to Joost Uitdehaag, one of the participating scientists: "Great initiative. It's a pleasant challenge to work on things other than your daily activities and it's inspiring to do something concrete for a developing country."

Making sense of science

The main challenge lies with the school students: it is up to them to make business sense out of the scientific proposals. A competition manual including the project descriptions is sent to the participants. It is their task to work out the scientific, financial and social elements of the proposal in enough detail to convince the audience that their project needs to be carried out. They are free to decide exactly how their action plan will look, but they need to incorporate their answers to the following questions:

- What technology is being used?
- Where exactly will the project be implemented?
- How does this affect people in the developing country?
- Who are you planning to approach?
- What will it cost?
- What problems could you expect?

Algae pond in Mozambique

Image courtesy of Foundation Imagine

Bram van Beek at the algae pond in Mozambique

Image courtesy of Foundation Imagine

Dr Kariuki explains how to make avocado oil

Image courtesy of Foundation Imagine

Image courtesy of Foundation Imagine

School students visit a Masai Mara village

In addition to acquiring a thorough understanding of the science and technology behind the idea, the students are confronted with a range of financial, political and social issues to solve. To help them with their questions, two separate activities are available over the course of the year:

1. Hands-on experiments at the scientists' laboratories help the students to understand the scientific background of the project. After acquiring information from the world-wide web and initial discussions with their science teachers, the students perform relevant experiments and can pose their questions to the scientists directly.
2. During a special 'knowledge day' held in the National Museum of Ethnology in Leiden, students have discussions with development-aid experts to get an idea of what it is like working in developing countries and which problems they can expect.

The final

A professional jury selects five business plans for the grand final of the competition, where the finalists present their plans to a professional audience and jury during an international conference. A promotional video made in co-operation with an experienced movie producer is shown to support each presentation. The students are trained in advance for this event: an instruction workshop brings them up-to-date on presentation tech-

BACKGROUND

The Imagine school competition has been running in the Netherlands since 2003; the fifth round will start in September 2007. The initiative originally stems from the Kluyver Centre for Genomics of Industrial Fermentation, a Dutch research consortium employing microbial genomics to improve micro-organisms for use in industrial fermentation processes. In 2005 the Foundation Imagine Life Sciences was established in association with Delft University of Technology to ensure the continuity of the school competition and implementation of the winning projects from previous years.

Image courtesy of Foundation Imagine

Chitosan beads

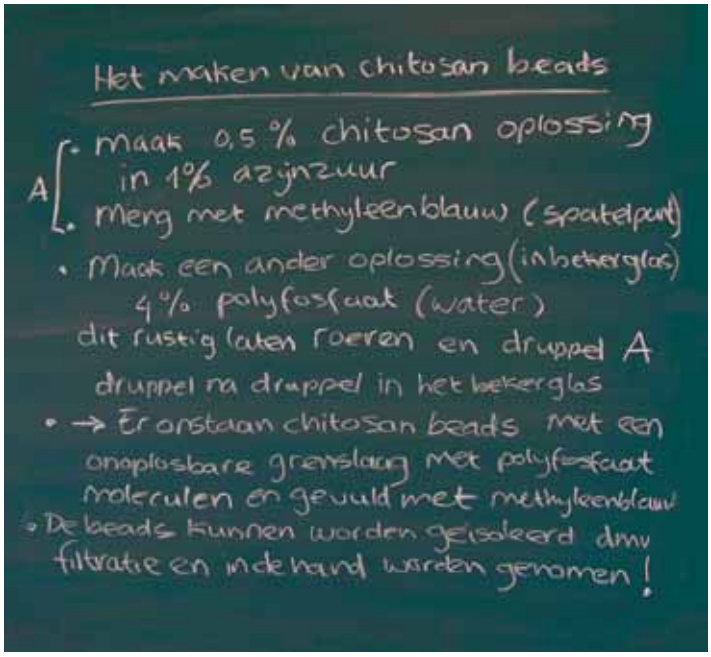

Image courtesy of Foundation Imagine

How to make chitosan beads

niques and PowerPoint tips and tricks, preparing them to give a high-quality and attractive presentation.

After the presentations the jury convenes to evaluate the reports and performances and to choose the winning group. Imagine supports the implementation of the winning project. After a period of fundraising and establishing contacts, the scientist and the winning school students visit the country where the project is being put into practice. After returning from Mozambique, Chang Liu, winning student of Imagine 2004, said "It was a lot more fun than I expected. I thought the contact with the scientists would be very formal. But we just had a great time together."

Goal: development

Four Imagine projects are now being carried out: the Dutch engineer Bram van Beek has constructed a pond in Mozambique to produce biodiesel from algae; Kenyan avocado farmer James Kariuki is turning over-ripe avocados into oil for cosmetic products; Bob Ursem, director of the botanical garden in Delft, is bringing new life to a plantation in Surinam, and plant researcher Johan Baars has developed a plan to grow oyster mushrooms to fight malnutrition in Ghana.

Making the ideas work

The strength of this competition lies in the unique combination of three objectives: to encourage researchers to implement their research for the benefit of society, to raise awareness

CLASSROOM ACTIVITY

School competition time schedule

Until August:	scientists submit proposals
Until September:	students register
September:	students are linked with projects
October:	students gather information
November:	laboratory experiments
December:	interviews with development-aid experts
February:	report submission and selection of finalists
March:	workshop presentation techniques
April:	final
From April:	the winning project is carried out

Image courtesy of Foundation Imagine

School students making chitosan beads

of development issues with school students, and to implement useful projects in developing countries. But this strength at the same time poses a challenge: organising the competition takes a lot of time and there are many potential pitfalls. If you are interested in setting up a similar competition in your own country, you may find the following details helpful.

First of all, good project proposals are not easy to write. You will need to find researchers who are willing to share their ideas and to put time and effort into the project. Next, their proposals should be checked for relevance, cultural acceptability and constraints such as intellectual property rights. This is a case-by-case exercise, requiring continuous attention throughout the year.

Motivating school students to join in is another challenge. You need to be aware of the national school system so that you can make the most of opportunities for project work within the curriculum. Attending teachers' conferences can help you to understand the challenges that teachers and students face.

Finally, carrying out technical projects in developing countries can pose problems. The history of development aid clearly shows the dangers of transmitting Western ideas to other cultures without adapting them: projects will not succeed if they do not fit into the local culture. The success of a project is not necessarily determined by its innovation, but by practical demand, cost-effectiveness, self-sufficiency and time constraints.

The key to addressing these challenges lies in interacting with the relevant networks. Cooperating with organisations that already have well established relationships with researchers, schools (for example the communication department of your university), or development organisations will help you to avoid some of the pitfalls.

The organisation of such a competition offers a steep learning curve and requires determination and enthusiasm from the organisers as well as from all those volunteers who are

BACKGROUND

Imagine aims to:

- Make young people aware of pressing issues around the globe and encourage them to take action
- Show them what role life sciences can play in alleviating urgent problems in developing countries
- Challenge life scientists to apply their expertise and tackle those problems
- Turn the combined efforts of scientists and school students into action
- Implement valuable projects where they are most needed and build on existing capacities.

willing to put in their time and effort. But seeing the projects succeed is very rewarding. By making these innovative ideas work in practice, Imagine encourages scientists, school students and people around the world to share their ideas in the life sciences.

Resources

The Foundation supports the establishment of similar competitions in other countries. If you would like further information, email info@foundation-imagine.org or telephone +31 15 278 6626. More information on the Imagine school competition is available here: www.foundation-imagine.org

Image courtesy of Foundation Imagine

Presentation during the final

The finalists present their proposals during an international conference

Image courtesy of Foundation Imagine

REVIEW

The article describes a current competition in the Netherlands that encourages (senior) students to develop business plans for ideas to aid developing countries which have been proposed by life-sciences researchers. Obviously, the organisation of a similar competition in another country would be a major undertaking but the benefits such a competition would bring to all of those concerned are innumerable.

During the competition, students gain an understanding of real-world problems, as well as experience of working with professional life scientists to understand and develop practical solutions to specific problems. Students also gain an understanding of the world of business and commerce as they are expected not only to explain the science behind the proposal to a lay audience, but also to provide the audience with costings and other development issues. Students are also expected to create a promotional video with the assistance of a professional producer – again an amazing experience for them.

Something that seems novel is that students actually receive instruction on many of the skills they will need during the completion, such as presentation skills. Such skills are extremely transferable and cannot help but increase the students' employability.

As an added advantage, the winning students are given the once in a lifetime experience of travelling to a developing country and seeing their work take shape and have a real effect on a community or family; something that they will never forget.

Mark Robertson, UK