vetenskap & allmänhet

VA Day focuses on learning

Report from "Living with Learning – VA Day, 2004"

"If I said I was going to set my hand on fire, you probably wouldn't believe me. Maybe you would just think I'm crazy," said **Seth Ericson** of Svenska Stuntgruppen, a media special effects company. And he set his hand on fire.
He then showed a scene from the television program "Blåsningen" – which exposes celebrities to practical jokes – in which Swedish soccer star Andreas Andersson watches a Porta-Potty come crashing down on top of a car he believes someone is sitting in.
When Mr. Ericson was asked to produce this scene, a lot of questions began buzzing through his mind. He used his knowledge of parachute jumping, rock climbing, construction engineering and physics, including the theory of motion and the effects of G forces on people, psychology, acting, cinematography, racing and needlework – which he detested in school – to make it all work.
"I learned sewing when I started parachute jumping. That's when it became necessary and suddenly fun," he explained. And then he made a small confession: "I have a safety fetish. I am constantly searching for new, better, lighter, stronger safety systems – in specialty stores for ice hockey, indoor bandy, martial arts, everyplace you can imagine. You never know when you can use them."
Getting the hand (made of silicone, it wasn't his real hand) to burn required extensive preparations and phone calls. "The people I phone experience an enormous surge of creativity. In this case, I wanted a fluid that burns as coolly as possible, perhaps only half as hot as gasoline. So they wonder what I want it for, then off they go. The best way to make students enthusiastic is to bring in creative people from outside, people who burn for what they do," Ericson said. After this illustration of "Living with Learning" he left the stage with his equipment.

Camilla Modéer, Secretary General of VA (Public & Science), welcomed everyone, thanked President **Eskil Franck** of the Stockholm Institute of Education for letting the VA Day take place on his campus and then turned the podium over to him.
According to Dr. Franck, teacher training, which his institute specializes in, is among the most important bridges between researchers and the public, and so are teachers themselves. It is important that teachers work in the spirit of science and teach children a critical attitude. He hoped the afternoon would embody a spirit of dialogue.

Ms. Modéer welcomed a group of **students from Nyckelskolan**, a Montessori primary school in Södertälje, to the VA Day, whose focus was young people's desire to learn. She welcomed the VA Day moderator, **Henry Chu**, host of the children's science show "Hjärnkontoret" on Swedish Television, who invited entrepreneur **Jane Walerud** and **Göran Johnsson**, chairman of the Swedish Metal Workers' Union, to the stage along with two of the students for a discussion about:

A knowledge-based society, what is that?

Today there is a lot of talk about the knowledge-based society. But what does science mean for jobs? "It means a lot! Knowledge leads to ideas, which in turn can be transformed into companies that generate jobs. At one company I worked with, which had 50 employees, only five had a university-level education.

But you know, those other 45 jobs were generated from scientific ideas from the five with a higher education," Ms. Walerud explained.
According to Mr. Johnsson, science and knowledge mean more today than yesterday and will be even more important in the future. He told about study visits to steel company SSAB and iron mining company LKAB, where employees do less and less manual work. In the service sector, too, more knowledge is required and there are fewer people with little formal education. Mr. Johnsson said he has a lot of faith in lifelong learning. He cited the unemployed and chronically ill as examples.
"How their future will turn out depends a lot on themselves. I want to encourage learning instead of passivity."
In the technology-based small companies that Jane Walerud works with, jobs are relatively advanced. She hopes new basic industries will emerge from such businesses and from today's research, that the smallest companies will become medium-sized and the medium-sized ones even bigger – thereby generating more jobs.
What kind of knowledge will be needed in the future? The answer was unanimous: you should focus on what you enjoy. Then the world will open up to you. And young people should not necessarily do what adults tell them. Be critical, make demands and learn throughout your life, Johnsson and Walerud advised the young people.

Do teachers in Sweden care about knowledge?

Yes, they do, according to a new VA study presented by **Arne Modig**, senior consultant at TEMO, a Swedish public opinion research institute. For example, seven out of ten teachers want to introduce research findings from their own field into their teaching. During the past year, six out of ten have been in contact with researchers. Six out of ten follow popular science-oriented literature, TV shows and radio programs; an equal number read scientific journals or ask questions of researchers, and six out of ten newly trained teachers would themselves consider postgraduate studies involving original research. Nearly all of them think it is important for students to learn how to search for knowledge by themselves and to examine sources critically. The Swedish-language report *Lärares syn på vetenskap* (How Teachers View Science) can be downloaded here: VA Report 2004:4.

Eva-Lis Preisz, President of the Swedish Teachers' Union, and **Agneta Odenbro**, chemistry teacher at Norra Real upper secondary school in Stockholm, presented their reflections on the study.

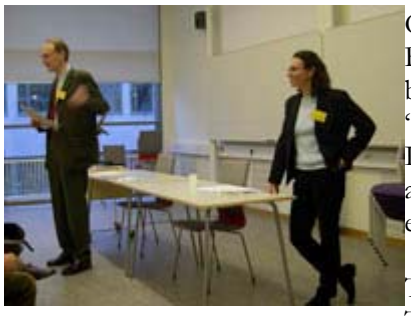
According to Ms. Odenbro, the study concurs with her own observations: there is great interest in science among teachers. But there is a systemic fault in the Swedish school system that makes it impossible to muster the energy and time to integrate research into instruction to the extent that teachers really want. Nor is there money for substitute teachers if they want to attend continuing education courses. Odenbro felt that time for reading, seminars etc. should be made an integral part of teachers' jobs and also called for a structure that allows them to take their students to various activities more often. "How much time can we actually steal from other teachers?" she wondered.

Ms. Preisz also stressed that demands on Swedish schools are increasing and that the schools are constantly doing more. She drew a parallel with the business sector: if the demands increase there, companies invest in human resource development. But this is not happening in the schools. And of research --about schools, too little money is going toward what is really needed, such as research into the problems the schools are grappling with. One solution may be combined positions that enable teachers to engage in both instruction and research, in the same way as is common in the healthcare system. Something for the Swedish teaching profession and municipalities to do in the future, Preisz hoped, while Odenbro thought this sounded a little unrealistic.

Then several parallel sessions followed.

Nobelprize.org and the Nobel Museum

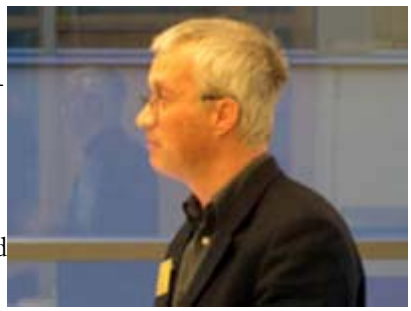
Anders Bárány, Senior Curator at the Nobel Museum, and **Agneta Wallin Levinovitz**, Executive Editor of Nobelprize.org, explained their common goal of stimulating young people to become more interested in science, medicine, literature and peace work. Both organizations are externally financed and work internationally: the Nobel Museum through its traveling exhibition and Nobelprize.org through its web site.



Quoting from the 1825 poem *Fritjofs saga* by Esaias Tegnér, Professor Bárány compared the two organizations to two lush trees, growing side by side under the care of their guardian (the Nobel Foundation).
"Anybody at all can earn a Nobel Prize, there are fine examples of this! It's all a matter of being at the right place at the right time when you are young. We want to inspire young people with that," Bárány explained.

The Museum's programs for young people are designed by educators. They are based on the Nobel Prizes. There is no room for laboratory experiments at the Stock Exchange Building in Stockholm's Old Town, where the Museum is housed. But through the Stockholm Science Circle, young people can continue to the Museum of Technology, the Swedish Museum of Natural History, the House of Science (a collaborative effort between the Royal Institute of Technology and Stockholm University) and Tom Tits Experiment (a science center in nearby Södertälje) for such activities.
"In Kuala Lumpur, the head of the museum wanted 300,000 school students to see the Nobel exhibition in three months. Afterward, he was unhappy; only 280,000 had come. Just imagine if everyone thought like that," Bárány said.
"Our quality-assured educational games on the web take between ten and twenty minutes to play and are free. With interactivity, young people can decide what happens and view the outcomes. Last year we had a million visitors. Because the games are in English, they are also a language exercise. We have received a lot of praise from such countries as the U.S.," Ms. Levinovitz explained. "'A really cool site, I didn't know science could be fun,' young people say. To improve their standing on the high score list, they study our help and background sections, thus learning even more."

The Swedish Net University



The Internet is an increasingly powerful tool in the learning industry, according to **Mats Ericson**, Director-General of the Swedish Net University. His job is to back up universities and colleges in their net-based learning. And this effort is going well. Of all university-level students in Sweden, 15 percent have taken at least one course with the Net University, and it recruits more students with working class backgrounds (1/3 of the total) than the regular higher education system (1/4). The Net University is needed because the world around us is constantly changing. More people need more education. At the beginning of the 20th century, there were only 800 university-level students and teachers − in the whole country.
"Today people are studying later and later in life. More and more students are older, have families and already have careers. It is a matter of dealing with mid-life adult learning. This requires more flexibility in time, space and pace," Professor Ericson said. "In the future, a campus will become a social happening. Libraries and cafés have a high 'reconnaissance factor'."

The move toward more online content is also important, according to Professor Ericson. He believes that more people must gain access via the internet to the scientific journals that all university employees and students already have access to.
"The world's knowledge is a mouse click away. And we in Sweden produce two percent of it, but we must join in taking advantage of the other 98 percent outside the borders of Sweden," he said.
In the future, he does not believe anyone will speak of the Net University. Its operations will be a natural element of our universities.

How the public views science

For the third consecutive year, VA has commissioned Temo to study how the public views science and researchers. The survey was headed by **Arne Modig**, senior consultant at Temo, who presented its findings.

It is difficult for ordinary people to understand science and technology, 70 percent of people in Sweden believe – but it seems to have become easier. The proportion of respondents who think it is difficult has gradually decreased from 81 percent in 2002. Somewhat fewer than previously, 72 percent, have great or very great confidence in researchers at institutions of higher learning. A large majority feel that in the past 10-20 years, both scientific and technological progress has made life better. But their confidence varies depending on the area. Nearly everyone is confident that research can help cure serious diseases and feels that government research funds should be spent on this, while only 13 percent want to spend these funds to achieve more knowledge of modern European history.
Temo has also studied what people regard as scientific. Medicine and biology are perceived as clear sciences, while there are doubts concerning economics and history. As many as two out of ten people in Sweden feel that astrology is a science, as do a full 30 percent of young people. "Education has a strong correlation with people's view of research and researchers," Dr. Modig noted. "People with a high educational level have a more positive view of research, have greater confidence in researchers and more frequently give a correct answer regarding what areas are scientific. The Swedish-language report *Allmänhetens syn på vetenskap* (How the Public Views Science) can be downloaded here, VA Rapport 2004:3.

How researchers view dialogue with the public

VA commissioned **Lena Levin**, Ph.D., to study how researchers view the interplay between research and the public. At the VA Day, she presented a focus group study in which 24 researchers and two research communicators participated.

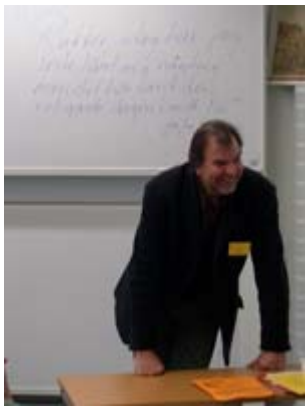
Both the concepts of "the public" and "dialogue" were discussed in the various focus groups, along with the role of the researcher in the dialogue. This role varies in relation to different segments of the public, for example organized interests, people who are interested/uninterested in research, individuals and practitioners directly impacted by research, schools, voluntary organizations, companies and mass media – which researchers describe in terms of a self-appointed public.
"Researchers are suspicious of journalists, at the same time as they would like more frequent media contacts if they could obtain greater influence on the contents of what is reported about their research, Dr. Levin said.
Unlike the media, researchers often want to describe the whole research process, because methods and questions are as important as the results in the research community. "This is why many researchers also want to get the public interested in scientific working methods and approaches," she said.

The clearest and most important obstacles that emerged from the focus group discussions were that:

- communication of research has a low value in career advancement contexts
- communication of research requires time and dedication – and when it does not promote career advancement, researchers prioritize other tasks.
- communication of research costs money, and little funds are allocated for the "third task" of Swedish higher education institutions (contacts with the surrounding society)
- communication of research has low status among organizations that fund research
- communication of research sometimes appears uninteresting because the public does not understand researchers.

The Swedish-language report *Forskares syn på samtal med allmänhete*n (How Researchers View Dialogue with the Public) can be downloaded here, VA Rapport 2004:5.

Inspired learning



Rutger Ingelman, drama instructor at the Stockholm Institute of Education, based his presentation on the encounter between teacher and student – in an inspired meeting characterized by mutual curiosity and respect. For 45 minutes, everyone in the room gained an insight into what happened when Rutger was given his name. His dramatized account spoke to all the senses and provided a good take-off point for people's memory.

"I believe that the teacher's role as storyteller is on its way back," Mr. Ingelman said. "Young people and children have a great need to be captivated by something. It is a matter of teaching in a way that is both moving and personal, as well as what kind of classroom climate we as educators can create with the help of images, books and stories. Young people need to be fascinated."

According to Ingelman, it is important to talk about what is useful to people – not just what requirements must be met in the schools.
"I tell students that they are going to school for my sake and each other's sake. That together, we will learn from each other and with each other," he concluded.

The desire to learn – how do we awaken, increase and expand it?

This question went first to **Ibrahim Baylan**, Sweden's new Minister for Schools, who was born in Turkey.
"I arrived in Sweden around age ten. It was a journey through both time and space. The place I came from was 100 years behind Sweden. I attended a monastery school – it was simple. You didn't need to understand, just learn by rote. For each word you missed, you were rapped once on your hand with a ruler.
"My first period here was hard, because I didn't speak the language. I felt stupid and sometimes cut classes. I may have been fairly intelligent, but I still felt like an idiot, because I didn't speak the language. Language is an important factor behind the desire to learn – for everyone. It is a socioeconomic problem. Without the language, everything becomes difficult. I want more reading in the schools. It is extremely positive that the Ministry of Education and Science and the Ministry of Culture are being merged. I will be discussing reading comprehension and how teacher training can become better at this with my colleague in the ministry, Leif Pagrotsky.

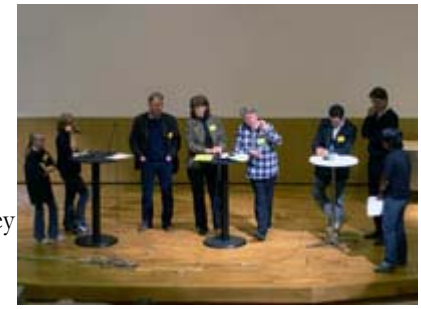
"I feel that it is anti-egalitarian to think that everyone doesn't need Swedish, English and mathematics in upper secondary school. On the other hand, it is perhaps neither necessary nor desirable for everyone to study in the higher education system. Knowledge is power. It develops people and gives them courage to participate in society, in the work of democracy and in making their dreams a reality."

Then there was a discussion about the desire to learn. Participants were **Martin Ingvar**, neuroscientist and professor at Karolinska Institutet medical university; **Astrid Pettersson**, Vice President of the Stockholm Institute of Education; **Ali Sharif**, upper secondary student at Tingvallagymnasiet, Karlstad; **Sverker Sörlin**, scientific director of the Swedish Institute for Studies in Education and Research; **Tjia Torpe**, Chairman of the Committee for Educational Science at the Swedish Research Council; as well as two students from Nyckelskolan.

"The purpose of the Swedish Research Council's targeted funding in educational sciences is to achieve interesting results that directly affect the schools. Why do young people learn to play the guitar so much more easily with their friends at home in the garage that in regular music class? There must be disparities between different people's way of learning," Ms. Torpe said.

"We actually know quite a lot about how to stimulate learning. Young people learn more easily in the garage because that form of learning is based on human nature: I can participate, I am seen, I am needed by the group," said Professor Ingvar.

"I know that, but how about teachers, school administrators, politicians and all the others?" wondered Torpe.



"Let me put it cautiously: there is some room for improvement. But not everything is individual when it comes to learning. There are general factors that we know sufficiently well. For example, one study shows that a fourth of all children are afraid of 'being beaten up' if they make a mistake, something that of course makes it difficult to learn anything at all," Ingvar said.

"Creative learning is the key. You learn more when it's fun and you feel a sense of belonging," said Mr. Sharif.

"Individualization is treacherous because standards are lowered to the point where there are no challenges left for some students," said Professor Pettersson.

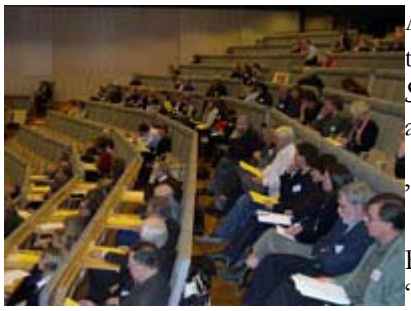
"But it is better to learn at your own pace, that way you avoid too much pressure," the students countered.

"What is 'your own pace?' That is something you have to define," replied Pettersson.

"Can you learn at any pace but your own? But it is good to be under pressure. I recently saw 'Swan Lake' in Cambridge, where I am living right now, with dancers from Moscow – an almost religious experience. How can they perform like that when nothing else works in their society?" Professor Sörlin wondered.

"When you let loose the individual pace of learning, you need to identify those students who need a push to get moving. The system is unfair to those who don't come from homes where they read. At Karolinska Institutet, 85 percent of dental students and 70 percent of medical students are women today. Female dominance is just as wrong as male dominance," Ingvar maintained.

"I want to test all your statements, Martin. But the Swedish Research Council doesn't fund commissioned research. Instead we want researchers themselves to come up with ideas. For educational researchers, curiosity-based knowledge seems to be important, while in the schools, commissioned knowledge dominates," Torpe observed.



A question from Gunnar Bjursell in the audience: "We used to assume that everyone is born the same. Today we often read in *Nature* and *Science* that we are biologically different. Will the schools take this into account in the future?"

"That is a tricky ethical question," said Ingvar.

But how do we awaken the desire to learn?
"You can do like in sports. You plant a seed early in a child's brain and let it grow into a tree of interest. Like on the science show 'Hjärnkontoret' and in the children's magazine 'Kamratposten'. For example, did you know that an ant can carry 40 times its own weight? As if you could carry home your own car. Fantastic! My chemistry and biology teacher has a passion for what she does. It inspires me to want to become a doctor," said Sharif.

"A lot depends on a teacher's personal dedication. Everything that can give direction to the intellectual process," said Ingvar.

"It is also important for the teacher to be proud of who she is and to do the best job for those who have to be there, her students," said Sörlin.

Where do we go from here?

Henrik Berggren, editorial writer at the newspaper "Dagens Nyheter", presented his reflections based on what had been said during the VA Day: "Obviously, curiosity must be allowed to drive research that may become useful. But it is reasonable to make demands of research. After all, it is financed by tax money. Ten-year-old immigrant boys from Turkey are not the only ones who have problems with language, it's also researchers. It is time for them to learn to tell us what they do, and why it is so enjoyable and important."

Lena Hjelm-Wallén, departing Chairperson of VA, continued:
"We are born curious. It is important that we can preserve that quality for a long time. Unfortunately something often happens along the way, and we don't really know why. The media have an important role in stimulating people's interest in science and knowledge. For this reason, next year's VA Day will focus on how journalists view science."

Majléne Westerlund Panke (at the right in the photo), who is taking over as Chairperson of VA, added:
"Vetenskap & Allmänhet can do a lot to increase the desire to learn, not least by dismantling the concerns that researchers and the public have towards each other. More encounters are needed in order to get the dialogue between them moving."

With that, she and Camilla Modéer concluded the VA Day by thanking all the speakers and participants.

Text: Erika Ingvald, freelance journalist